amateur radio

Vol. 35, No. 5
MAY
1967

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"AMATEUR RADIO"

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FEDERAL COMMENT

☆

Another Easter has come and gone and so has another Federal Convention. The 31st Convention held in Hobart from 24th to 27th March is now history and once again a band of men foresook their Easter holidays and families to gather around a conference table to debate the many problems confronting the Amateur Service in Australia and I.T.U. Region III.

Detailed reports of the decisions of Federal Council will appear in this and future issues of "Amateur Radio," but it can be stated here that discussions on Federation went a step further and it is now possible that the Federal Company of the Wireless Institute of Australia may be a reality within twelve months.

Another subject of interest to most Amateurs is the Remembrance Day Contest and Federal Council has re-affirmed its decision to change the rules in line with the proposals put forward in the December 1965 issue of "Amateur Radio". Accordingly, and because of this change, the new rules will be published twice this year.

The exhortation "Amateur Frequencies: Use Them or Lose Them" is often seen in the pages of this journal and there is no reason at all why the higher frequency bands, particularly 21 and 28 Mc., should not be used by more Australian Amateurs—no reason that is, other than apathy of course. Despite the somewhat pessimistic predictions by the experts both these h.f. bands have provided good DX. In recent weeks, the 28 Mc. band has produced openings to Africa, Asia, Europe and North America and 21 Mc. has been even better. In general, the QRM problem is less than on other bands and quite long and enjoyable DX ragchews are available without the interference of the annoying "break, break" practice that is so prevalent on the lower bands these days. Effective antennae are relatively small and easy to construct and a.m. is still used frequently on 28 Mc., although the use of s.s.b. is growing. It will indeed, be a pity if more Australians do not take full advantage of the frequencies we still have remaining to us--whilst they do remain with us.

—D. H. RANKIN, VK3QV, Federal Activities Officer.

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THE VIBRATOR ELIMINATOR

R. L. HARRISON, VK3ZRY*

TRANSISTOR power supplies are nothing new. In Amateur circles they are being used quite widely with, apparently, some deal of success. Many (or most) are being used in home-brew equipment or for supplying mobile s.s.b. transceivers of foreign origin.

Now over the past few years there have appeared, from various sources, large numbers of v.h.f. transceivers (both f.m. and a.m.) that have seen service in taxis, tow trucks and the like. The majority of these were designed and built some years ago when vibrators were all the rage. By the standards in those days, vibrators were efficient, economical and solved the power supply problem.

Then along came transistor power supplies with toroidal transformers and 80-90% efficiency. This was a significant increase in efficiency over vibrator supplies; the best efficiency obtainable there being 60% (most were 45-55%). Consequently transistor power supplies were incorporated in the later mobile v.h.f. transceivers. Unfortunately, these are not, as yet, in abundance and many Amateurs have the ones with vibrator supplies.

Now in view of the (possible) W.I.C.E.N. use of these transceivers, they should be made to operate as efficiently as possible. Aside from that, if you own a small car or an automatic, you don't want the battery to run down quickly. For example, a 6v. MR3A carphone junior draws 20 amps. on transmit. All that for only 1½ watts r.f. output is a bit ridiculous.

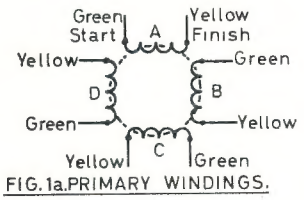


FIG.1a.PRIMARY WINDINGS.

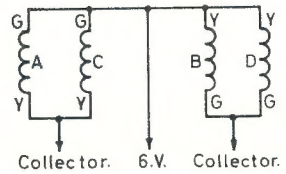


FIG.1b. CONNECTIONS FOR 6V. PRIM.

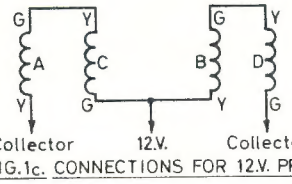


FIG.1c. CONNECTIONS FOR 12.V. PRIM.

* 1 Mary Street, North Balwyn, E.9, Vic.

A UNIVERSAL TRANSISTOR POWER SUPPLY

The toroidal transformers necessary to make efficient transistor power supplies are not too readily available. Generally you have to buy a core and design and wind your own; but this can be an exceedingly tedious process. With a bit of hunting around, I found that one local manufacturer had available a universal toroidal transformer available. It was capable of operation from a 6v. or 12v. supply and delivered 300v. and 150v. at 45 watts. This was just what the doctor ordered for small transceiver purposes, so a transformer and a suitable circuit was obtained.

The transformer came from Aegis Manufacturing Co. and is Type S105A. They are available through normal trade supply channels, or if any delay, direct from the manufacturer.

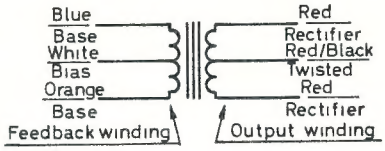


FIG.2a-2b.

To enable 6v. or 12v. operation, the primary is wound in four sections around the core. The leads are brought out together in four pairs around the core. The starts and finishes of the windings are coloured green and yellow respectively (refer to Fig. 1a). Pick one pair of yellow and green wires—check with an ohm meter and call that winding A. Now, going clockwise around the core are windings B, C and D. The connections for 6v. and 12v. operation are shown in Figs. 1b and 1c respectively. Fig. 2a shows feedback winding arrangement and Fig. 2b shows output winding.

A complete circuit of a 12v. power supply is given in Fig. 3. This is suitable for supplying various a.m. and f.m. mobile v.h.f. transceivers. Table 1 lists operating voltages, currents and efficiency. The two transistors can be any of ASZ17, OC35, OC28, or ASZ15.

Input		Output		Efficiency
V.	I.	V.	I.	
Volts	Amps.	Volts	mA.	%
6	8.5	300/150	150	88
12	4.5	300/150	150	83.4

Table 1.

The unit can be built onto a chassis of about 6" x 4" x 2", 18 gauge aluminium. Mount the two transistors at opposite ends of the chassis and insulate them with mica washers and insulating bushes. The toroid, S105A, can be bolted to the chassis in a convenient spot using the two discs of sponge rubber and the bakelite disc for protection. The other components can be mounted on tagstrips. Paint the box black (except around the transistors) to improve heat dissipation.

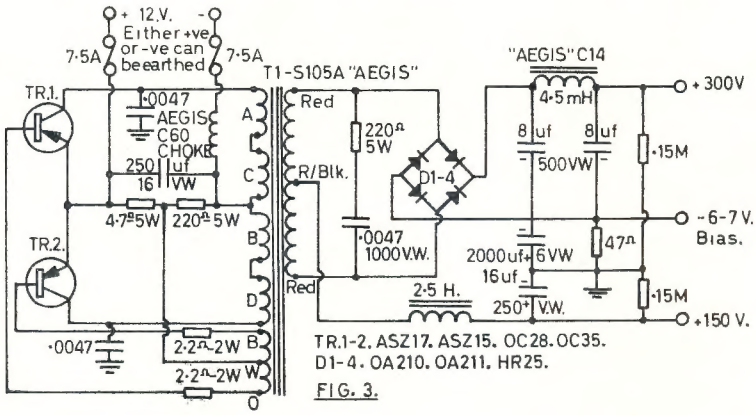
A complete, ready made, power supply is available from the same firm, Type PS25. It is very similar to the one described above except that it is **only** 12v. input and no bias is provided. (Circuit similar to Fig. 3).

MR3A CONVERSION

These little devices are very plentiful, but horribly inefficient. They draw 20-odd amps. (on 6v. input) and run a 6J6 in the final, giving only about 1½ watts out. A QQE03/12 in the final and a transistor power supply **giving 300v.** to the 3/12 would improve things. This was mentioned in an article by Jim Stewart, VK3ZFS (now VK3AS) in October 1965 "A.R."

Some time ago I was approached by Bill VK3AAV, who wanted a transistor power supply installed in his MR3A. Like most small car owners, he was having worries about battery consumption. Also, the fact of having a 6v. battery tended to aggravate the position.

When the unit was presented to me a QQE03/12 had been installed in the final and Bill was desirous of applying 300v. to the driver and p.a. anodes to increase the output. Well, it appeared to me that an S105A toroid was the answer, so one was procured and the



TR.1-2. ASZ17. ASZ15. OC28. OC35.
D1-4. OA210. OA211. HR25.

FIG. 3.

following conversion took place. (Referring to the circuit in "A.R." for October 1965, pages 14 and 15.)

I found that W1, the selenium rectifier stack, had already been removed and replaced by four OA210 diodes, so I left that as it was. I removed L11 and L12 and the shield. This then enabled me to remove the vibrator and its socket. T19 was then disconnected and removed from the chassis. Don't forget to tag the wires coming from the power switch S1. I then disconnected L10 from the **second** 24 uF. capacitor and the negative side of the **first** 24 uF. capacitor was removed from the bias and earthed.

The S105A toroid was then temporarily positioned near the crystal and the 6AQ5 (on top of chassis). I decided to use two 11 amp. SFT265 (Ducon) transistors that were on hand. Any transistors of 10 amp. or more rating can be used, e.g. ADY26, ADZ11, ADZ12, 2N1100 or n.p.n. SE3030-33. Consult Photo 1 and position the transistors so that they fit without fouling anything. Mount them with mica washers and insulating bushes. Drill necessary mounting holes and clean the burrs off. The toroid can now be permanently mounted, using the two sponge rubber discs and the bakelite disc as in Photo 1.

nicely. Most of the underside layout can be gleaned from Photo 2.

When you have everything wired and **checked**, connect 'er up and switch on. The toroid should "sing"—if it does not, reverse the blue and orange leads on the feedback winding (**not** while it is on!). The toroid should now "sing" happily when the supply is turned on. It may not be too loud though.

Be sure that you have the battery polarity correct!

Check the voltages with a multimeter and see that they are something like those in Table 2.

(Continued on Page 9)

Photo 1

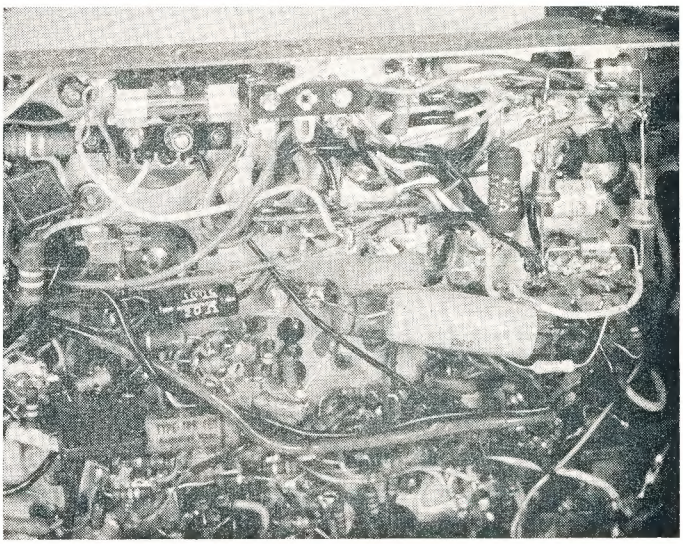


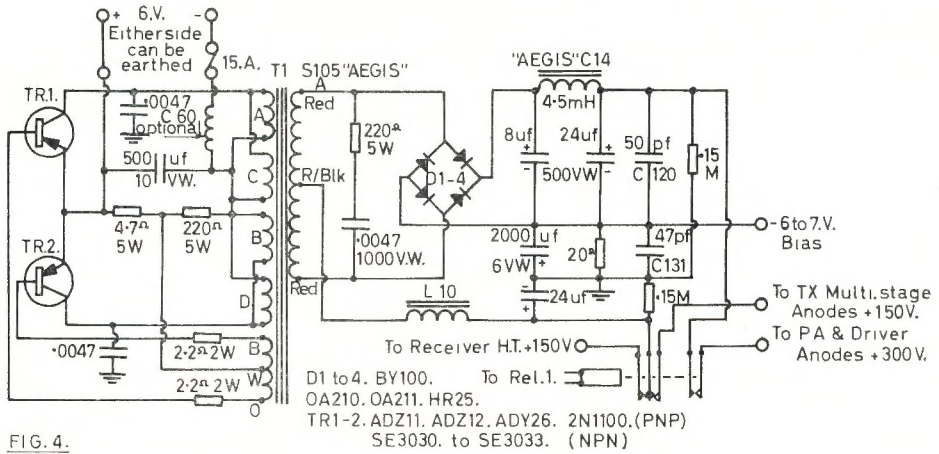
Photo 2

Another relay, Rel.2 (see Fig. 4) was then mounted across the hole where the vibrator used to reside. (See Photo 1, lower hand corner.)

Rel.2 has a set of changeover contacts and a normally open contact (see Fig. 4). The coil of Rel.2 is connected in parallel with Rel.1. The connections to the h.t. changeover contacts on Rel.1 were removed and connected to those on Rel.2. This is to prevent 300v. being applied to the QQE03/12 and driver anodes before excitation. If this is not done, the cathodes of the driver and p.a. suffer damage and shortens tube life.

In Fig. 4 you will notice a choke in the h.t. filter marked C14. This is another Aegis product designed for use in transistor power supplies. I mounted this just behind the speaker. A two-lug tagstrip was mounted under the bolt of the choke L10 and on this I mounted an 8 uF. electrolytic (500v.w.). It is the first filter capacitor and is easily seen in Photo 1.

Now the underside of the chassis was pretty clear after removing W1, L11 and L12 and the other power supply components, so everything was mounted under here. A liberal sprinkling of tagstrips was used and everything fitted



D1 to 4. BY100. OA210. OA211. HR25.
TR1-2. ADZ11. ADZ12. ADY26. 2N1100. (PNP) SE3030. to SE3033. (NPN)

FIG. 4.

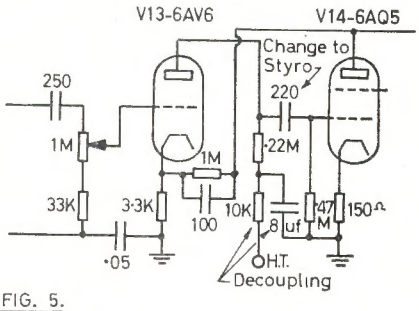


FIG. 5.

	H.T.	Bias Line
P.A. and Driver	284v.	2.3v.
Multipliers, Oscil. and Audio	124v.	2.3v.
Receiver	148v.	1.2v.

Table 2.
Bias measured across 20 ohm resistor in supply.

	Input Current	Input Volts
Receiver only	6.6a.	6
Tx Standby	9a.	6
Tx button down	13a.	6

Table 3.

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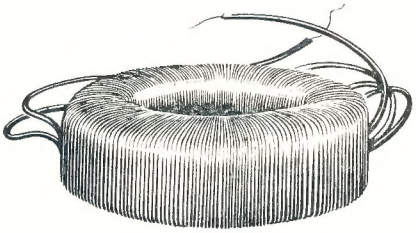

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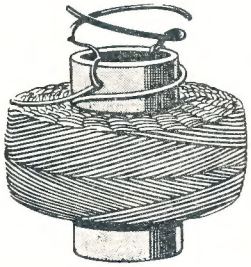

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OVERTONE OPERATION OF QUARTZ CRYSTALS

PART TWO

D. H. RANKIN, VK3QV*

THE first part of this article appeared in the March 1967 issue of "Amateur Radio" and briefly described the nature of the overtone mode of oscillation and differences between plated fundamental crystals and plated overtone units. In Part Two it is proposed to discuss practical limits on frequency and activity for third and fifth overtones, a simple method of approximately measuring the equivalent series resistance [e.s.r., i.e. R_m of equation (3)] of an overtone crystal and finally to discuss good and bad overtone oscillator circuits.

FREQUENCY AND ACTIVITY LIMITS

Third Overtone Crystals are recommended for use between 20 and 60 Mc. although they can be made down to frequencies as low as 10 Mc. and as high as 80 Mc. Third overtones are not recommended below 20 Mc. principally because fundamental crystals are readily available up to (in fact over) 20 Mc. and in general fundamentals are to be preferred for Radio Amateur work when there is a choice. Between 10 and 20 Mc. price is not usually a factor, but above 20 Mc. a fundamental mode crystal will become far more expensive than an overtone. A second reason for preferring a fundamental to an overtone under 20 Mc. is that the e.s.r. or activity of an overtone crystal tends to increase with decrease in frequency. Thus in practice a good third overtone at 15 Mc. would have an e.s.r. of approximately 40 ohms, but a 15 Mc. fundamental would have an e.s.r. in the order of 10 to 15 ohms.

At the other end of the range, expense is once again the main deterrent to using thirds above 60 Mc., but also above this frequency the quartz plates become so fragile that special mechanical and electrical precautions have to be taken to achieve a satisfactory life performance. International specifications[1] relating to quartz crystal units usually require third overtone crystals between 20 and 60 Mc. to exhibit an e.s.r. of 40 ohms or less. This figure can easily be achieved by the manufacturer if the plated area (see photos in Part One) is made relatively large.

As usual though, you do not get something for nothing and if the plated area is made too large the crystal will show a tendency to jump frequency and it is interesting to note that such a jump for an AT will always be to a frequency higher than the correct overtone. To overcome this problem international specifications limit the plated area by specifying the maximum value of Co—and remember this is due to the parallel plate capacitor effect with two plated electrodes separated by a quartz disc. For any AT cut crystal, fundamental or overtone, this limit on Co is 7.0 pF. This means that in practice, if this 7.0 pF. is maintained, the e.s.r. of a third overtone crystal will be between 10 and 40 ohms. Any overtone crystals with an e.s.r. of say less than 15 ohms should be viewed with suspicion. Measure the Co—a standard 1 Kc. or 10 Kc. bridge is quite satisfactory for this purpose as it is the static capacitance that is required—and if this is above 7.0 pF. carefully check the overtone frequency obtained from that crystal. It may be 60 to 100 Kc. higher than it should be—sometimes—and really, is there anything more useless than a crystal that moves frequency of its own accord?

Fifth Overtone Crystals are best used between 60 and 100 Mc. although they can be manufactured down to 50 Mc. and up to about 125 Mc. Once again the low end of the range 50 to 60 Mc. overlaps the upper end of the third overtone range and the latter types will have a better activity typically 40 ohms at worst compared with the 60 ohms at worst for the fifth overtone units.

Cost becomes the major problem above 100 Mc. and at this time this frequency can be conveniently classified as the top limit for quartz crystals. Besides price, such factors as circuit design and the measurement of e.s.r. become a real problem and unless an Amateur is prepared to spend a lot of time experimenting with oscillator circuits, units above 100 Mc. should not be considered.

International specifications[1] require that fifth overtone crystals have an e.s.r. of 60 ohms or less and a Co of 7.0 pF. or less. The remarks made above concerning Co in excess of 7.0 pF. apply to fifth overtones also. Any fifth overtone unit exhibiting an e.s.r. of less than 20 to 25 ohms should be viewed with suspicion.

Seventh Overtone and higher order crystal units have been produced, both in Australia and overseas, but because of their specialised nature they will not be considered further here. Suffice to say that overtone units as high as 250 Mc. have been made and it will only be a matter of time before such items become readily available to Amateurs.

DRIVE LEVELS

Calculation.—This is a subject that seems to cause great confusion amongst Amateurs. It is not just the voltage appearing across a crystal nor the current flowing through it, that matters—it is a combination of both. The thing that does matter in fact is the power, i.e. the product of voltage and current, that the crystal is required to dissipate. Further, it must be stated that the voltage and current here are the r.f. values at resonance. The d.c. voltages associated with a crystal are relatively unimportant and unless the quartz breaks down a crystal will not pass direct current. (It is worth noting that d.c. voltages up to 1000 volts may be applied to a crystal without damaging the quartz, but this is not good engineering practice. The insulation in the crystal base may fail and thus, in turn, cause power supply failure.) Small values of r.f. current, particularly in the v.h.f. spectrum, are not easy to measure directly and thus it becomes necessary to calculate power dissipation from the following formula:

$$P = \frac{E^2}{R_m} \quad \ldots \quad \ldots \quad \ldots \quad (8)$$

where P = Power dissipated in watts.
E = R.m.s. r.f. voltage across the crystal at series resonance in volts.
R_m = E.s.r. in ohms.

A similar formula involving e.p.r. must be used in those cases where parallel resonant operation is involved (E of course would be larger in this case than with series resonance), but because this article is about overtone crystals and this type of operation is not recommended at v.h.f., the variation will not be treated here.

The maximum recommended dissipation for either a third or fifth overtone unit is 2 mW. Consider the worst case for a third overtone, i.e. a very active crystal with an e.s.r. of 10 ohms (it is easier to overdrive an active unit). Applying formula (8) we get:—

$$\frac{2}{10^3} = \frac{E^2}{10}$$

i.e. $$E^2 = \frac{2}{10^2} = 0.02$$

or $E = 0.14$ volts or 140 mV.

For a marginally good crystal, i.e. one with an e.s.r. of 40 ohms, E becomes 280 mV. Thus the r.m.s. r.f. voltage across any plated third overtone crystal should be between 140 and 280 mV. If you do not know the e.s.r. of a particular unit you will always be safe if you keep below the lower limit.

The corresponding minima and maxima for a fifth overtone are 220 mV. and 350 mV. respectively, based on a best e.s.r. (or worst case condition) of 25 ohms and a worst e.s.r. of 60 ohms.

If a crystal is subject to mild overdrive the frequency will drift over a period of time. Severe overdrive will result in severe drift and frequency jumps and finally complete failure when the plated material is thrown off the quartz. Better frequency stability will be achieved with drive levels lower than 2 mW., e.g. for overtone crystals in ovens the recommended figure becomes 1 mW. in lieu of the 2 mW. quoted for a "cold" crystal.

All the figures quoted above are for crystal units in metal can type holders that are not evacuated. B7G, B9A and other glass type holders that are normally evacuated must be considered separately because crystals in such holders will exhibit a much higher activity. As a rough guide the voltages quoted above should be halved for the evacuated types.

Measurement.—R.f. voltage can be measured up to 100 Mc. with the average v.t.v.m. although the usual instru-

* 1879 Malvern Road, East Malvern, S.E.5, Vic.

ment with a 1.5 volt f.s.d. on the most sensitive range does leave a little to be desired. A meter with a 500 mV. range would be more useful if available.

Equation (8) stated that the power dissipation is dependent upon the r.f. voltage developed across the crystal at series resonance and the e.s.r. Thus the remaining parameter to measure to allow completion of a power calculation is e.s.r. Fig. 5 shows an experimental set up, the accuracy of which is only limited by the quality of the test equipment used.[2] The crystal is inserted in a "pi" network and is connected between a signal generator or v.f.o. and a suitable detector, say a v.t.v.m. The signal generator is tuned until a maximum deflection is obtained on the voltmeter. At this point the crystal resistance is at a minimum and for practical purposes can be considered as operating at series resonance.

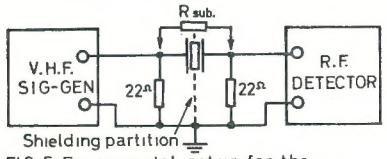

FIG. 5. Experimental set-up for the measurement of crystal E.S.R.

If the crystal is now replaced by a **non-inductive** resistor, R_{sub}, which gives the same meter deflection as the crystal, the crystal e.s.r. is then the same as R_{sub}. Inaccuracies will be caused if the signal generator has a high harmonic content in its output waveform—when R_{sub} is in circuit the fundamental signal plus harmonics from the generator will pass through to the detector and will register on the voltmeter. When the crystal is in circuit only the overtone frequency to which the generator is tuned will pass through to the detector (a crystal filter). This problem can be eliminated if a frequency sensitive or tunable voltmeter is available (a receiver equipped with a calibrated S meter for example), but such devices with a range of 20 to 100 Mc. are not readily available to the average Amateur. Thus in most cases, the answer obtained is only approximate. The best arrangement then would consist of an oscillator with zero or low harmonic output coupled with a tunable v.h.f. voltmeter.

The resistance of the "pi" shunt arms should always be kept below that of the crystal and the resistors used must be non-inductive at the test frequencies. It is recommended that the input and output circuits be thoroughly screened to avoid stray leakage across the crystal.

There are other methods of measuring e.s.r., but they involve the use of rather specialised crystal impedance meters. These units are simpler and quicker to use in practice, but are no more accurate than the technique outlined here.

An arrangement similar to Fig. 5 was used to obtain the curves in Figs. 2 and 4 in Part One of this article as well as the data presented on the respective pole-zero spacing of a 3 Mc. fundamental and third overtone crystal.

OVERTONE OSCILLATOR CIRCUITS

There are a number of ways in which oscillator circuits may be classified—feedback or negative resistance, aperiodic (untuned) or tuned, series or parallel resonant, and so on. The class of circuit required for an overtone crystal is a tuned, feedback type at series resonance. Most of the oscillator circuits used in r.f. work are of the feedback variety and the usual overtone configurations follow suit. The circuits must be tuned because of the frequency spectrum of a crystal as shown in Fig. 4 (Part One). The fundamental and unwanted overtone modes must be surpressed by the oscillator design "picking" the preferred overtone. This is done most easily by a simple tuned circuit—the gain around the oscillator circuit will be very low except at the resonant frequency of the tuned circuit. Aperiodic circuits cannot be used for overtone operation as such circuits will usually oscillate the crystal on its fundamental frequency if it will oscillate at all.

Some simple crystal checkers described in the Amateur literature recently claimed to check crystals up to 30 Mc. This is most unlikely as the higher frequency units examined were probably overtones and the "checker" checked their fundamental properties.

The advantages of series resonance operation have been outlined by J. Nagle[3] and this mode is strongly recommended. In point of fact there is no reason why fundamental crystals should not be operated this way either. Experimenters should note then that any of the circuits to be described will operate perfectly well with either fundamental or overtone crystals provided the correct values of frequency sensitive components are chosen. Another interesting point to note about series resonant circuits is that if the crystal is short circuited the oscillator will free run on a frequency near that of the crystal. A parallel resonant oscillator does not possess this property.

Examples of series resonant circuits are the Butler (Fig. 6a), the grounded-grid oscillator (Fig. 6b), and the Squier oscillator (Fig. 6c). There would seem

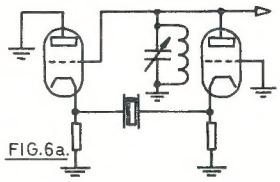

FIG. 6a.

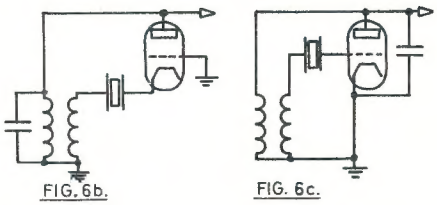

FIG. 6b. FIG. 6c.

Schematic Diagrams of Basic Series Resonant Circuits.

Fig. 6a.—The Butler oscillator.
Fig. 6b.—The grounded-grid oscillator.
Fig. 6c.—The Squier oscillator.

to be little need to use the Squier configuration these days because correctly made overtones are not hard to start. The Squier used inductive feedback to "kick" the crystal into oscillation on its overtone and this is satisfactory provided the crystal is not momentarily overdriven. Thus the degree of feedback must be carefully regulated or else—poof! and such catastrophes are not covered by manufacturers' guarantees either. The popular "Robert Dollar" oscillator suffers from the same problem and excessive amounts of feedback have caused many complete crystal failures. Sometimes the failure is not complete—the crystal only shifts frequency up by a few tens of kilocycles, but the story is always the same. "The crystal was okay for a start, but one day when I turned it on it went for a second and then stopped." **For this reason the Robert Dollar is not recommended for use with plated overtone crystals.**

The grounded-grid configuration also uses inductive feedback, but because this circuit is useful at the higher frequencies, a recommended circuit is given later, that will give satisfactory results if the inductor details are followed.

The simpler forms of circuits such as outlined in Fig. 7 are not recommended because they do not oscillate the overtone at series. If the frequency accuracy is not important then a rock calibrated for series could be used in such circuits but it would of course be a few kilocycles off marked frequency. Remember f_s and f_p!

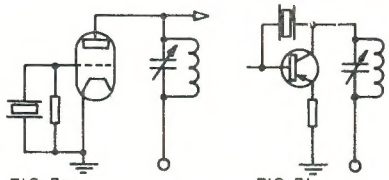

FIG. 7a. FIG. 7b.

Schematics of oscillator circuits NOT recommended for use with overtone crystals.

Let us now consider a number of practical overtone circuits.

The Butler or cathode coupled oscillator is perhaps the best known of the series resonant type of oscillator circuit. Basically the circuit is made up of a cathode follower and a grounded-grid amplifier. Maximum frequency stability is obtained when the valves are 180° out of phase, i.e. the circuit is purely resistive. One of the family of double triodes, e.g. 12AT7 or 12AU7, may be conveniently used for this type of circuit. Fig. 8a gives the constants for third overtones between 20 and 60 Mc.

The tuned circuit in the plate of the grounded-grid stage is necessary to ensure that the desired overtone frequency is selected, i.e. for a 46 Mc. third overtone L1C1 must tune 46 Mc. The resistor in the plate circuit of the cathode follower may be replaced by L2C2 shown in Fig. 8b, but this circuit can only be tuned to twice or three times overtone frequency. If L2C2 is made to tune the overtone frequency, then oscillations not under control of the crystal will take place. If a frequency multiplier is not required, use the circuit in Fig. 8a with the resistive load.

Low Q coils are recommended as greater selectivity results in a larger phase shift and hence larger frequency change with percentage capacity change in C1, i.e. whilst adjustment of C1 will "pull" the frequency of the crystal this will be minimised by making the Q of L1 low. A useful size of former is 3/8 inch diam. and the polystyrene type should be quite satisfactory up to 60 Mc. If ferrite slug tuned coils are to be used, the slug material must be suitable for operation at v.h.f. Brass slugs would be quite satisfactory, but it must be borne in mind that they have the opposite effect to ferrite types, i.e. the resonant frequency of the tuned circuit will **increase** as the brass slug is screwed **into** the inductance.

The cathode resistors are part of the oscillator network and ideally they should be of equal value. The frequency stability is greatest when these resistors are as small as possible consistent with reliable oscillation. Poor activity crystals may be made to oscillate if the value of the cathode resistors is increased, but once values above about 1K ohms become necessary, care should be taken as the circuit may tend to free run.

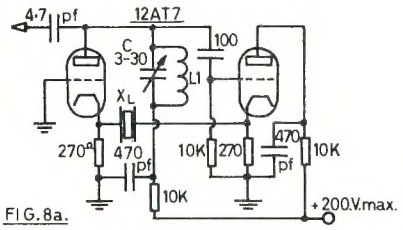

FIG.8a.

The Butler Overtone Oscillator.
Output at Overtone Frequency.
XL—Overtone Crystal, 20 to 60 Mc.
L1—To tune, with 3-30 pF., to frequency of XL.

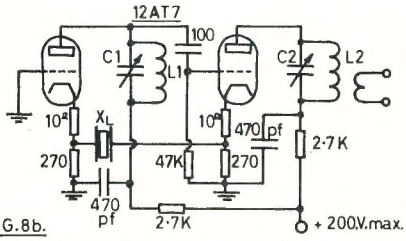

FIG.8b.

The Butler Overtone Oscillator.
Output at twice or three times Overtone Frequency.
XL—3rd O/T Crystal, 20 to 60 Mc.
L1C1—To tune Overtone Frequency.
L2C2—To tune two or three times XL Frequency.

Switching crystals in this circuit is rather a messy procedure and consequently the Butler oscillator is usually used where only one crystal frequency is required—a v.h.f. or u.h.f. converter for instance.

The grounded-grid oscillator, unlike the Butler, has not received much attention in the Amateur literature. The circuit is well suited to the higher frequency crystals, particularly fifth overtones between 60 and 90 Mc. The circuit shown in Fig. 9 appeared, in a slightly different form, in some application notes published by Cathodeon Crystals Ltd., of U.K.[4]

The grid of the 6AQ4 or EC91 is grounded for r.f. by the 470 pF. capacitor and consequently this should be a good quality low inductance type, e.g. a button mica. L1C1 should resonate at the desired crystal overtone and in practice adjusted for maximum output from the oscillator. C2 may be adjusted to slightly "pull" the crystal frequency as required. The degree of coupling between L1 and L2 should be carefully watched as excessive feedback may cause crystal failure. The information given in Fig. 9 is quite safe for the 60 to 90 Mc. range.

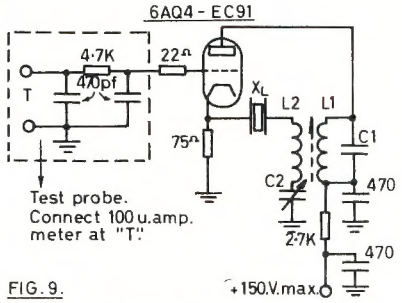

FIG. 9.

The Grounded-Grid Oscillator, 60 to 90 Mc.
L2—1 turn 28 s.w.g. at ground end of L1.
C2—2-10 pF. trimmer.

Tuning Range	L1 close w'nd 22 s.w.g.	C1
60 to 70 Mc.	4 turns	20 pF.
70 ,, 75 ,,	4 ,,	14.7 ,,
75 ,, 80 ,,	4 ,,	10 ,,
80 ,, 85 ,,	3 ,,	18 ,,
85 ,, 90 ,,	3 ,,	14.7 ,,

The "Impedance Inverter" is another useful circuit and it has one very big advantage over the circuits already described—one side of the crystal is earthed. One form of this circuit has been described by W3JES and those interested are urged to read the article mentioned in reference 3 to obtain more background in this subject. Another form of the "Impedance Inverter" has been discussed in some detail in "Break In"[5] and "Info,"[5] but the important points are repeated here. Refer to Fig 10.

The adjustment procedure is as follows:—

1. Short circuit the crystal. The oscillator will "free run" at a frequency determined by L_x, C1 and C2.
2. With C1 and C2 as shown, tune L_x until the circuit oscillates near the required overtone frequency.
3. Remove the short circuit. Crystal controlled oscillation at the overtone frequency should now take place.
4. Tune L_x for minimum r.f. voltage across the crystal. This will be series resonance. L_x may be offset from this point if the crystal frequency need be pulled slightly.

Double or triple the overtone frequency may be obtained if the plate resistor is replaced by the appropriate tuned circuit. Switching crystals in this circuit is not particularly difficult, but it is strongly recommended that the unused crystals be short circuited. The switching could be on the crystal side of L_x if all the crystals were close together in frequency—say 200 or 300 Kc. (f.m. nets) or on the grid side of L_x. In the latter case, there would then have to be a separate series inductance for each crystal.

The values for C1 and C2 given have been optimised and provided the ratio is kept about the same as recommend-

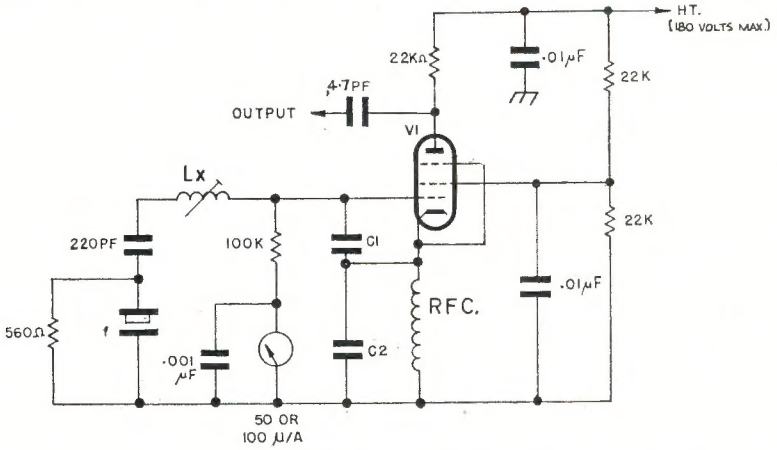

FIG.10. IMPEDANCE INVERTING OSCILLATOR
(25 - 70Mc/s)

V1:—
6AK5
6AM6
6BH6
6CQ8 (pentode section).

Notes:—

1. f is overtone frequency NOT fundamental frequency.
2. The anode load resistors (22K ohms) may be replaced with a tuned circuit at 2f or 3f (never at f) to obtain multiplied output.
3. The meter and 0.001 uF. capacitor as shown are only necessary to check oscillator grid current. If not required, directly earth the 100K ohms resistor.

f Mc.	Lx uH.	C1 pF.	C2 pF.
25	6.7	10	22
30	4.7	10	22
35	3.5	10	22
35	3.5	4.7	10
40	2.6	4.7	10
45	2.1	4.7	10
50	1.7	4.7	10
50	1.7	3.3	6.8
55	1.4	3.3	6.8
60	1.2	3.3	6.8
65	1.0	3.3	6.8

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500K log, 1⅞" shaft with slot.
500K log, ⅞" shaft with slot.
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15c plus S/T 25%.

TAB POTS

Less shaft, 100K linear. **10c** plus S/T 25%.

M.S.P.

10K log, s.p.s.t. switch.
25c plus S/T 25%.

I.R.C.

50K log, d.p.s.t. switch (short shaft). **25c** plus S/T 25%.

Large type, 1¼" diameter:
500K with tap 40K and d.p.s.t. switch.
500K with d.p.s.t. switch.
30c plus S/T 25%

Pack and post 5c each or 25c dozen.

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A & R TYPE 1960

Primary: 10-0-200-220-240-260v.

Secondary: 190v. tapped at 170v. at 100 mA.; 55v. at 10 mA.; 12v-0-12v. at 130 mA.; 6.3v. at 4a.; 6.3v. at 4a.

Grey metal case with solder terminals; originally made for D.C.A.

$3 plus S/T 12½%
Pack and Post 50c.

AUDIO TRANSFORMERS

A & R TYPE 2713

Primary: 12,000 ohms p.p
Secondary: (1) 150 ohms, (2) 150 ohms. Total 3 watts.

50c plus S/T 25%.
Pack and Post 10c.

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AMERICAN SYLVANIA
$1.75 ea. or $18 doz.
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TRANSISTOR TRANSFORMERS

A & R TYPE 2675

Primary: 25 ohms.
Secondary: 150 ohms at 5 watts, with feedback winding.
Originally for outside broadcast use.
Response 30 c.p.s. to 15 Kc.

50c plus S/T 25%.
Pack and Post 20c.

SPEAKER TRANSFORMERS

A & R TYPE 2655

Primary: 5,000 ohms s.e.
Secondary: 33 ohms (similar to E Type Rola).

25c plus S/T 25%.
Pack and Post 10c.

TRANSISTOR TRANSFORMERS

ROLA TYPE LDR43

4300 ohms to 600 ohms c.t.

25c plus S/T 25%.
Pack and Post 5c.

CHOKES

A & R TYPE 3052

1 Henry at 80 mA. D.C. resistance 30 ohms.

25c plus S/T 25%.
Pack and Post 10c.

AUDIO AMPLIFIER MODULES

Four-Transistor: 1 watt output.
High impedance input: 100K ohms.
Low impedance input: 1K ohms.
Output impedance: 4, 8 or 16 ohms.
Power source: 6 volts.
Gain: 70 db.
Size of board: 4½" x 2" approx.
Supplied with circuit and wiring instructions.

$7.50 plus S/T 12½%.
Pack and Post 20c.

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Including resistors, mica condensers, tubular condensers, styroseal condensers, grommetts, transistor transformer and potentiometer. Ask for Polypac No. 8.

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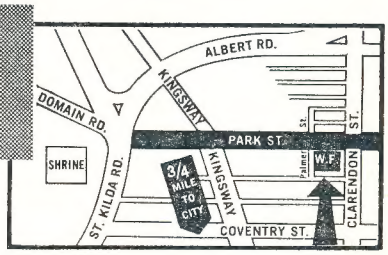

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ed, some variation is permissible. Thus by experiment it is possible to choose C1 and C2 so that only the crystal and L_x have to be switched, say, between 20 and 40 Mc. Alternatively, fundamental and overtone crystals may be mixed together provided the appropriate value of L_x is switched into circuit and compromise values for C1 and C2 found by experiment. The Impedance Inverter could thus be of great use in all-band s.s.b. exciters. Of course if the oscillator valve is being made to operate as a frequency multiplier as well, then the tuned circuit in the plate would have to be switched too if the switched crystals were more than 100 Kc. or so apart in frequency.

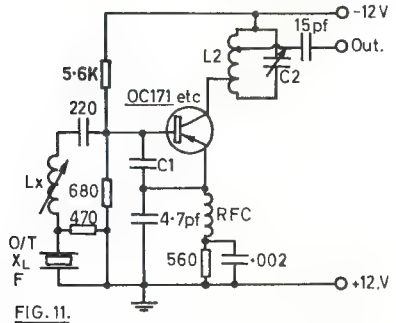

FIG. 11.

A Transistor Overtone Crystal Oscillator.

Freq. Range	C1	Lx
25 to 35 Mc.	56 pF.	See
35 ,, 45 ,,	39 ,,	Text
45 ,, 55 ,,	27 ,,	

L2C2 to be tuned to twice overtone frequency — 2f.

Taps on L2 to be adjusted experimentally for maximum output.

If output at overtone frequency f is desired, L2C2 MUST be replaced by either an R.F.C. or a small resistor.

Fig. 11 illustrates a transistorised version of the "Impedance Inverter" and reference 6 describes another version developed experimentally for 100 Mc. fifth overtone crystals.

CONCLUSION

The way in which overtones differ physically from fundamental type crystals has been described and in addition circuits have been presented that should allow the keen home constructor of s.s.b. gear or v.h.f./u.h.f. equipment get the best out of his overtone rocks. It has become almost a tradition with the v.h.f. men to use 8 Mc. crystals to get on to 52 or 144 Mc. Why not use an overtone on 26 or even 52 Mc. for the lower band and a 24, 36 or 48 Mc. rock for two? Because of the limited power available from the crystal oscillator, a buffer amplifier would almost certainly be a necessity, but the approach is different. Where are the experimenters amongst the Amateur ranks?

The final comment on overtone crystals should probably be on a new development. Some mention is sometimes made of the possibility of constructing a filter with overtone crystals. Yes, it is certainly possible and one day band pass filters with 500 Kc. or so bandwidths may be available at 52 and 144 Mc. Recent American literature has described filters with a centre frequency of 68 Mc. and a 6 db. bandwidth of 13 Kc., and experimental units up to 125 Mc. have been produced in laboratories. Thus an interesting and exciting future in the field of crystals and crystal filters is in store for those Amateurs who like to know what goes on behind the panels of their gear.

ACKNOWLEDGMENTS

To Pye Pty. Ltd., Clayton, for the photographs used in Part One, and to Reg. Richards (VK3RR) and John Foster (VK3AFX) for helpful criticism and advice.

FEEDBACK

Equation (2) in Part One should read:—

$$\text{e.s.r.} = R_m \left\{1 + \frac{C_o}{C_a}\right\}^2$$

The overtone poles and zeros in Fig. 4 Part One should read $\approx 3f_s$, $\approx 3f_p$, $\approx 5f_s$ and $\approx 5f_p$.

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GOD'S GIFT TO THE HAM: THE XYL*

ROBERT H. BLACK,† VK2QZ

We all know that the Ham is gentlemanly, loyal, progressive, friendly, balanced and patriotic. These virtues are automatically acquired when he passes the examination and gets his licence. A man of such high qualities is hard put to it when the time comes to select a suitable mate for the generation of legitimate harmonics and the other things which go with marriage.

It is a fit thing that there is among the daughters of Eve a select class of women with qualities to match those of the Hams. And so one of these becomes the XYL after a short period of courting between contests with a minimum of reference to the domestic implications of Amateur Radio.

The qualities the Ham admires in his XYL make a very long list and I have selected only a few to talk about tonight.

She, too, is friendly. When the Old Man is away at work she gets the Handbook from the shack and learns all about radio so she can understand what he is talking about. She welcomes the unannounced Ham visitors and always produces tea and scones without a murmur.

She is tolerant. She never calls the Old Man to a meal when he is in the middle of a QSO. She thinks it right and proper that the shack should look like an overgrown rat's nest because she believes that this is the environment necessary for the creative imagination of the Genius. And she never, never attempts to tidy it up.

She is helpful. No matter what she is doing in the kitchen or elsewhere around the house she will stop at once to help the Old Man with a difficult bit of soldering in the shack. She keeps the log during contests and makes the coffee when the band goes dead. She fills in and sends off the QSL cards, paying for the postage out of the housekeeping money.

She helps the Old Man remember important things which he might forget —like mowing the lawn, cleaning out the roof guttering, all those non-Ham things which keep a Ham balanced. And she puts circles, black circles, around the dates of DX contests on the kitchen calendar.

She keeps the Old Man progressive. She suggests that a neat little transceiver is much better than the rack and panel transmitter, the receiver which weighs a hundredweight and all the junk which goes with it. She offers him a small table in the lounge where the new transceiver will look nice with the t.v. And when the exchange has been made, her ability to plan becomes evident: the shack can now be used for the kids. She thinks that a quad adds so much to the appearance of the place, and she keeps the convolvulus off the co-ax. without having to be told.

She is enthusiastic. She looks forward all the year to the hamfest when she can get together with the other XYLs (and the ants and the flies) and blow about the virtues of her Old Man —how he mowed the lawn last month and fixed her bedside light during his holidays last year.

She is co-operative. She doesn't complain to the R.I. when the Old Man's voice comes through the record player —she just switches it off and makes herself useful washing the car, doing a little carpentry or painting the house —little jobs which God created women to do. She makes a little game out of digging blobs of solder from the carpet.

These qualities, and many more, are what a Ham expects in his XYL.

And all my XYL can add is that a woman must love a Ham a hell of a lot if she can put up with him.

— • • • —

* Divertisement at N.S.W. Divisional Convention Dinner, 1967.

† 2 Yerton Avenue, Hunter's Hill, N.S.W.

THE VIBRATOR ELIMINATOR

(Continued from Page 3)

By now you would probably have noticed some "whine" in the output. No worries, just change the 250 pF. mica audio coupling capacitor to 220 pF. styroseal and decouple the 6AV6 (V13) h.t. as in Fig. 5. This should effectively remove the whine. No whine was observed on the modulation.

Table 3 gives the currents drawn by the unit. Note that on transmit the current drawn now is only 13 amps. and not 20-odd amps. You are now getting more r.f. out too!

Well, that completes the conversion. One Saturday afternoon's work should see you with a somewhat more efficient transceiver. Don't forget that almost any of the mobile v.h.f. transceivers about can use this rather handy toroid.

AN A.C. SUPPLY FOR THE 122 SET

A GENERAL DUTY A.C. SUPPLY FOR VALVED OR TRANSISTORISED EQUIPMENT

RODNEY CHAMPNESS, VK0CR (EX VK3UG)*

I MUST admit before I start that I have not actually built this particular power supply, but I have done measurements to get approximate circuit values, so I feel that anyone building this supply will have no problems in getting it going.

I first came to design an a.c. supply for the 122 set after I had been discussing with some owners of 122s the various modifications necessary to make it a good Amateur portable transceiver. Many of these modifications have been described in earlier issues of "A.R." It had always been assumed that the 122s would be used off batteries and not off the a.c. in any way. It was thought, well why not an a.c. supply capable of plugging into the set direct without using the vibrator supply at all? It was decided that a supply capable of supplying 12 to 13 volts of filtered d.c. at 2 amps. and at h.t. voltages to suit the receiver and transmitter sections at the necessary currents be designed.

The receiver voltages have been kept approximately the same but the voltages on the p.a. and modulator of the transmitter have been increased to between 340 and 380 volts, which will mean the transmitter will be able to run up to about 30 watts on a.m., maybe slightly more on c.w. There is only one power position now, not three as with the original vibrator power supply. I doubt that this will worry anyone greatly.

* Macquarie Island.

H.T. SUPPLY

The h.t. supply is fairly conventional and if it supplies between about 300 volts and 380 volts on full transmitter load, which will be about 160 mA., it will be quite okay. The transformer should have a rating of at least 125 mA.

A double pole changeover relay is required in the power supply to switch voltage to various parts of the set, and to switch in various components to make the voltage suitable for the particular part of the set.

The relay is shown in the unenergised position, which means the set is on receive. In the receive position, h.t. is applied through R3 to the VR150 and 15 volt zener diode (possibly an OAZ232), giving about 165 volts regulated. The h.t. is then passed through R5 which drops the receiver h.t. to about 150 volts at pin 2, which supplies the r.f. section of the receiver. The current drain through pin 2 varies between 8 and 13 mA., depending on a.v.c. action, thus the reason for the voltage regulation system.

The output from R5 is also applied via the relay to pin 3 which supplies h.t. to the receiver audio section—which is also the transmitter modulator section. The two capacitors on this line act as by-passes at r.f. and audio frequencies. On receive the current drain through pin 3 is 7 mA. at 150 volts. This is the receiver h.t. line-up. The receiver should have no less voltage than 150 as the gain drops rapidly if the voltage decreases. If R5 and the zener diode were eliminated, oscillation of the VR tube and electrolytic combination could occur. If you can get away without these, all to the good.

When the relay is energised, pin 1 obtains full h.t. which will depend on the particular power supply; this is the main h.t. to the transmitter. Pin 3 is now connected through the relay to a different dropping resistor which is arranged in value to give 180 volts at 14 mA. or up to a maximum of 200 volts at about 17 to 18 mA. Don't exceed 200 volts, this is already 20 volts over the maximum for the valves being supplied on this line. The approximate values of R4 are shown on the diagrams for various supply voltages.

This completes the h.t. supply to the set. The h.t. can come from an existing power supply if desired, helping to cut costs. In fact, this is probably the best idea as suggested by the heading of this article.

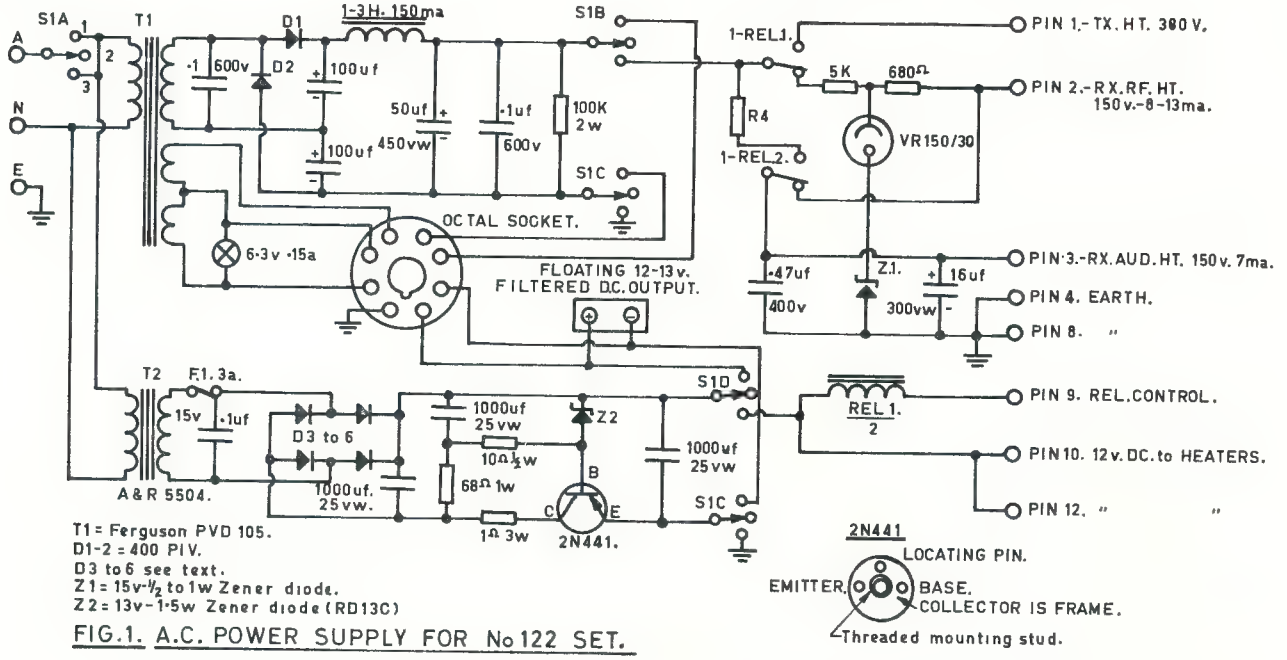

FIG.1. A.C. POWER SUPPLY FOR No 122 SET.

Switch S1—
Position 1: Power on, a.c. and all d.c. voltages applied to octal socket, all voltage sources floating in respect to earth.
Position 2: Power off.
Position 3: Power on. All required voltages required for 122 set applied to appropriate pins of 12 pin 122 set power socket.

LT bridge rectifier diodes to be 1.5a. to 3a. rating, at least 50 p.i.v. rating, and preferably 100 p.i.v. rating.

If two 6.3 volt and one 5 volt a.c. windings are seriesed for l.t. supply, R1 is to be increased to 100 ohms 2 watt, and R6 is to be increased to 1.5 ohms 3 watts.

12 VOLT D.C. SUPPLY

We now come to the 12 volt d.c. supply for the valve filaments, heaters, and relays. This is required to be in the 12 to 13 volt range with good filtering. The effective filtering capacity due to the transistor dynamic filter is in the region of 20,000 to 30,000 uF., which should be quite adequate.

The d.c. low voltage supply is an adaption of the first transistor regulated power supply I described in an article some months ago. Originally I tried this supply using the two 6.3 volt windings of a power supply in series as the source, but found the voltage developed across the capacitor at the bridge rectifier output not quite sufficient to operate the regulator-filter effectively. A. & R. put out a 15 volt 2 amp. transformer (No. 5504) which is not expensive and this gives a peak d.c. output of 21 volts. 15 volts times 1.4, equals 21 volts. When loaded, this transformer should not drop the output d.c. volts across the first filter capacitor below about 16 to 18 volts. At 2 amps. there is a voltage drop of 2 volts across R6, which decreases the output voltage available to the regulator transistor.

R6 has only one purpose, that of overload protection and may be dispensed with if this facility is considered unnecessary. Don't blame me if you do in the regulator transistor through leaving it out! With the 1 ohm resistor in series with 2N441 it can never draw more than 15 amps. approximately if a short occurs in the output. The fuse will blow within a short time as long as it does not exceed 3 amps.

If the idea of having to buy a separate transformer seems foreign to you and you have a transformer with two 6.3 volt windings and a 5 volt winding in addition to the h.t. winding, you are in business as long as you change the h.t. rectification over to high voltage silicon diodes, so freeing the 5 volt winding from the h.t. network. The three windings in series give 17.6 volts r.m.s. and give, when rectified, 24.6 volts peak d.c., which is plenty for the 12 volt d.c. supply to work effectively with.

HT Volts	300	340	380
R4, ohms	5K	8K	10K
R4, watts	3	5	5

Table 1.

In Table 1 is given the values for the various resistors in the d.c. l.t. supply and d.c. h.t. supply for various supply voltages. The l.t. drain is approximately 0.2 amp. receive only, 1.3 amps. standby, and 2 amps. on transmit. The relay in the supply can be any 12 volt relay with about 100 ohms or more coil resistance. No heat sinks will normally be required for the diodes, which have only to handle 1 amp. average current. Possibly 1 amp. diodes might do the job here, but I feel it would be unwise to use the diodes right on their limit, when diodes of 1.5 to 3 amp. rating are relatively cheap.

The zener may need a small heat sink, and the 2N441 will need a small heat sink of a few inches square, about 4 inches square would do. A Ferris 700 heat sink would certainly do the job. The 2N441 will only be dissipating between 10 and 20 watts although it is rated up to 150 watts.

I have drawn the supply as if I were going to use a modern voltage doubler transformer, such as the A. & R. 2064 or Ferguson PVD105 for the h.t. with the A. & R. 5504 as the l.t. supply source. I have drawn the supply in such a way that it could be used to supply any other normally a.c. operated equipment, as well as its use to supply transistorised gear up to 2 amps. at 12 to 13 volts. In all, a rather universal power supply, which could be used for many jobs around the shack or workshop, as well as for its design purpose of supplying your 122.

The 122 is quite a good set and I see no reason why it should not work well on this supply, giving more output than originally intended into the bargain. The 122 will tune s.s.b., with the netting switch in; with the original b.f.o. it is not brilliant. Most 122s are stable enough to be tuned by product detector bound s.s.b. transceivers. Don't let your 122 rust away—ACise it and use it. I hope to make this supply myself when time permits and I am in a location where I can buy parts or scrounge same. I trust you will find it as good as I expect it to be.

— . . . —

FIFTY AND OVER

"Good morning, Bert. I thought you'd be on this morning. This is VK3ZOM in duplex cross-band contact with VK3ZFC. Yes, Bert, I couldn't switch on the rig quickly enough after hearing the news. I think every Amateur who has a rig working will be on the air this morning. No wonder, since it's been declared a special holiday for all licensed Amateurs, to celebrate the findings of the Royal Commission on Amateur Radio . . .

"Yes, Bert. It's funny you should say that. I can't remember hearing about it before, either. They must have kept very quiet about it. Never mind. The main thing is that all the findings are going to be accepted. You haven't got the paper yet? The front page is full of it. I like the way the report begins. It says, 'This Commission, having decided that educating and helping people is as important as killing them, and taking cognisance of the great need for international friendship, hereby recommends that Amateur Radio be declared a National Service . . .' You know, Bert, I thought these things were run by old fogies and fuddy-duddies, but this mob is really on the ball. Think of it! Three weeks fully paid extra leave each year to attend lectures and conventions and do field and experimental work. And free issue of special equipment to all licensed experimenters.

"How about the new licences? Yes, Bert, there will be a few squeals but personally I think they're a great idea. The paper has all the details. It says here, 'Amateur Radio will henceforth be divided into two distinct categories, the technical and the communication . . .' and then goes on to give all the details. One advantage is that the blokes who like DX and ragchewing and buy commercial gear won't have to go on pretending to be interested in electronics. As long as they know enough to operate and do elementary repair and maintenance, they'll be right. But the communications requirements are stiff. Fifteen w.p.m. Morse, an elocution test, two hours operation on a simulated international traffic net, and four-hour exam. on regulations, traffic and procedures; and the ability to recognise at least fifty basic words in each of four foreign languages.

"The technical licence? Yes, Bert, I'm going for that. I'm not much interested myself in the ragchew side. Of course there's nothing to stop anyone getting both tickets. From what it says here the technical exam. will be a lot tougher. We'll have to do a lot more than just scramble through Ohm's Law. And apart from the exam. we've got to design and build a complete rig and justify it to a board of examiners.

"But, of course, we'll be allowed fifteen watts on all bands so we'll be able to experiment with more transistorised gear. What's that you said? International regulations? Of course we have to be familiar with the Morse Code, but in practice that'll mean being able to recognise the letters and no more. Of course some blokes will scream about the low power, but if they want more they can get a communications ticket. Anyway, we can always get permission to use up to 1 kw. for special experimental projects. But the beginner's licence will do most to build Amateur Radio. The paper here says it won't be very hard but they get a bit of an exam. on everything. And three watts on all bands. After five years they have to get one or both of the other licences, but in special cases they can get a further five-year extension. The special five thousand dollar 'Most improved Amateur of the year' award will give these blokes a lot of incentive. Of course we can go for it too.

"Did you say how about t.v.i.? We won't have any more trouble with t.v.i., Bert. If the inspectors find the rig is okay, then the person who complains will be prosecuted for being in possession of equipment capable of receiving transmissions not covered by his licence. Mind you, we can't be too hard on the viewers. Some of the poor coots haven't the brains to do anything else. So if anyone with a crummy t.v. set asks me to keep off one of the bands while he watches a thriller, I wouldn't be rough on him or report him to the inspectors.

"Of course, now that we're a national service we'll have to help in all emergencies, demonstrate gear, teach others, help at clubs, schools, scout groups and so on when we're needed. It'll take a bit of our time, but I reckon that's fair enough.

"The first thing I want to do is to put up some new aerials. What's that? Get up the mast? No Bert, I won't need to get up the mast. It's one of those tilting ones. No, Bert, I told you already I **won't** have to get up the mast. Don't keep on saying 'Get up' . . . Oh crickey!!!!!! All right, all right, **all right!** I'm awake now. I'm getting up. Cross? Of course I'm cross! You'd be cross if someone woke you from the best dream you ever had!"

—Roy Hartkopf.

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AN ALL-BAND CURTAIN ARRAY

AL SHAWSMITH, VK4SS*

The curtain described is for those who have limited yard space, but nevertheless aspire to all band operation. It is an attempt to get the most from the least. Its only extra requirements over a random length flat top of the G5RV type is some copper wire and a few more insulators. Not much to pay for a few extra db. on 14, 21 and 28 Mc.

An array roughly similar to this appeared recently in the R.S.G.B. "Bulletin". It was called a horizontally polarised Bruce Array. This does not seem to fit fully the curtain shown here. Some have called it a Lazy "H" with inverted end sections. Others a Sterba. Give it any name you wish, it is the results that count.

This configuration will take up no more room than the very popular G5RV antenna which has a flat top length similar to this all-band array. This curtain will radiate well on all bands from 160 to 10 metres. While I have called it an all-band array, its operation on 160 and 80 metres is really that quarter wave and half wave dipole respectively. On 40 metres the curtain begins to have some effect on radiation. From 20 to 10 metres the gain is increased and the angle of radiation is lowered.

In general its maximum radiation is broadside to its length and bi-directional. Being in the main horizontally polarised, its performance increases with its height above ground.

On 40 metres it functions as a two half waves in phase, very slightly extended and at this frequency the curtain configuration begins to have some affect in lowering the angle of radiation. This angle of radiation is progressively lowered through to 28 Mc. Gain over a dipole on 7 Mc. may only be a couple of db.

Operated on 14 Mc., the main lobes on each side of the array appear to have a shamrock-like pattern. This makes it very broad and the gain may be 3-4 db.

In use on 21 Mc., all the horizontal elements being in the main phase, the broadside gain is considerable; quite likely 6-7 db. Off the ends, there is very little radiation, in fact, for broad coverage, it is almost too sharp for this band.

On 28 Mc. several lobes appear. The array carries some eight wavelengths at this frequency and spacing between top and bottom elements is near optimum, so angle of radiation is low.

SOME PRACTICAL COMPARISONS

With the curtain only in a temporary position (the bottom elements only 15 to 20 feet above ground), it was not expected that DX could be worked on 80 metres with QRP. However, Europe, Asia and U.S.A. have been QSO'd.

Tried against a four-element vertical Bruce Array on 40 metres, it gave surprisingly comparable results, both on transmit and receive. Signal reports were the same from Europe, Asia and U.S.A. I can only conclude from this that the array performs better than it appears on paper, on this band.

Compared against a five-element vertical Bruce Array on 20 metres, the results directly broadside were a little disappointing, about one-half point less. However, this is due to the overall radiation pattern. You can't have it in every direction. On receiving, it is superb.

On 21 Mc., it performs as stated above, as a bi-directional beam. There is a strong lobe broadside and little off the ends.

Used with only 15 watts on 28 Mc., DX is easily workable when the band opens.

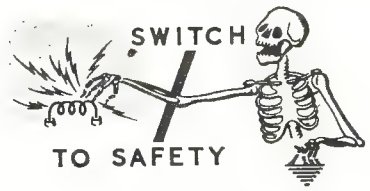
GENERAL COMMENTS

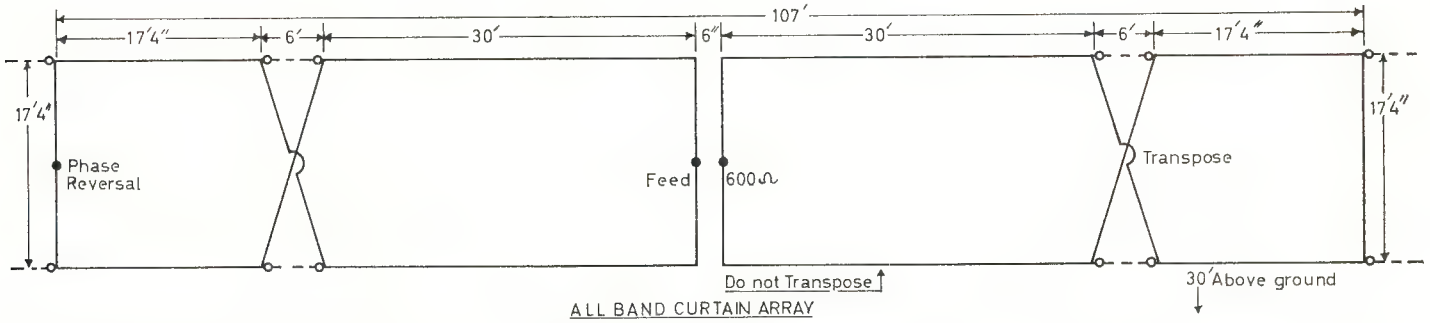
If the curtain is erected so that its length is N/NE by S/SW it will throw strong lobes to Europe, Asia and North Africa on one side, and South America and beyond to Africa and Europe on the other side.

Using a good antenna coupler, with provision for both series and parallel tuning, no trouble was experienced in loading on any band. It may be a little reactive on 21 Mc.; also the feeder length may have to be pruned a little, if it is reticent to accept current on any particular band. The higher it can be raised from the ground, the better it will perform. Minimum height of the bottom element for DX on 14-28 Mc. is 20 feet, and 30 feet for DX on 3.5-7 Mc.

As it performs so well on receive, it should make an excellent stand-by antenna, or be ideally suited for the general purpose s.w.l. who wants improved reception from 1.75 to 30 Mc.

One last comment. No attempt can be made to match the 300-600 ohm feeders for all-band operation. However, with a transmitter using pi network output, and a simple s.w.r. in the co-ax. to the antenna tuner, it was found that the array could be adjusted to a reasonably low s.w.r. on all bands.





ALL BAND CURTAIN ARRAY

* 35 Whynot St., West End, Brisbane, Qld.

Book Review

THE RADIO AMATEUR'S OPERATING MANUAL

The latest of the A.R.R.L. publications, this manual lives up to the reputation set by the other A.R.R.L. handbooks and manuals over a number of years.

Although most of the information contained in this manual has previously appeared in other publications from time to time, this is the first time that the data applicable to the operating of an Amateur Radio Station has been gathered together into one manual.

Well over half of the material applies to subjects applicable only to operation in the U.S.A., such as message handling, national traffic system, and The Amateur Radio Emergency Corps, but the chapters dealing with operating an Amateur Radio Station and general operating practices will be of interest to Australian Amateurs.

Available from Technical Book and Magazine Co. Pty. Ltd., 289-299 Swanston St., Melbourne. Australian retail price, $1.40, postage 15c.

VK-ZL-OCEANIA DX CONTEST 1966 RESULTS

AUSTRALIA

BAND LEADERS

	C.W.		PHONE	
Multiband—				
VK2EO	18455	VK2APK	11270
2APK	16220	2VN	10400
2VN	14225	4LT	9245
10 Metres—				
VK2VN	1685	VK4LT	1610
2APK	900	4PJ	795
2EO	500	2VN	745
15 Metres—				
VK9GN	5765	VK2VN	4140
6BE	4110	3ABA	3635
2APK	4070	6DR	3375
20 Metres—				
VK2EO	9145	VK2APK	6745
4SD	7800	2VN	5515
2KM	7630	6XX	4895
40 Metres—				
VK2EO	4850	VK2APK	1000
2AGI	4850	7SM	935
3AXK	3135	3XB	760
80 Metres—				
VK2VN	690		
3XB	430		
2EO	320		

C.W.

Call	80	40	20	15	10	Total
VK2EO	320	4850	9145	3640	500	18455
2APK	55	2310	6570	4070	900	16220
2VN	690	1310	7525	3015	1685	14225
2GW	55	2930	6040	3680	55	12760
2KM	—	2070	7630	2615	—	12315
2BKM	—	2330	6415	3095	290	12130
2AGI	—	4850	—	—	—	4850
2YB	—	1915	—	—	—	1915
2BIH/1	—	—	685	—	—	685
2BRF/1	—	—	560	—	—	560
VK3AXK	165	3135	5970	2775	—	12045
3APJ	55	1390	5230	3425	55	10166
3XB 4	430	1600	3665	2185	—	7880
3DQ	—	1000	3425	1930	—	6355
3ABR	—	1590	3925	—	55	5570
3YD	—	—	4485	—	—	4485
3ZR						3110
3ABA	—	—	—	3030	—	3030
3APN	—	2850	—	—	—	2850
3QP	—	—	—	2570	—	2570
3RJ	—	—	—	1955	—	1955
3QV	—	—	275	—	—	275
3OP	Check					
3YU	Check					
VK4SD	—	—	7800	—	—	7800
4UC	—	—	2300	—	—	2300
VK5FH	—	—	6580	—	—	6580
5FO	—	2185	3750	—	—	5935
5RX	—	—	3300	—	—	3300
5MY	—	55	1845	450	—	2350
5WI	—	—	1015	590	—	1605
VK6BE	—	300	—	4110	—	4410
VK7SM	—	2675	4740	2450	—	9865
7DK	—	1675	2675	—	—	4350
7RY	—	315	785	—	—	1100
7LJ	—	—	550	—	—	550
7ZZ	—	—	215	—	—	215
VK8HA	—	—	3850	1870	155	5875
VK9GN	—	490	4715	5765	—	10970
9CJ	—	—	2950	2120	350	5420
9BJ	—	—	835	1715	—	2550
9XI	—	—	3645	55	—	3700
9DR	—	—	55	2385	—	2440

PHONE

Call	80	40	20	15	10	Total
VK2APK	—	1000	6745	3055	470	11270
2VN	—	—	5515	4140	745	10400
2AUS	—	—	3765	1335	—	4100
2AOU	—	—	755	—	—	755
2AKV	—	—	630	—	—	630
VK3ABA	—	—	—	3635	—	3635
3LW	—	—	3430	—	—	3430
3XB	—	760	1485	—	—	2605
3QV	—	320	1325	—	—	1645
3HL	Check					
VK4LT	—	—	4855	2780	1610	9245
4FA	—	—	4835	1330	660	6825
4JM	—	—	3075	1445	695	5215
4SF	—	—	4540	—	—	4540
4AL	—	—	2610	575	—	3185
4DO	—	—	3420	—	—	3420
4PJ	—	—	1070	155	795	2020
VK5WO	—	—	2095	920	375	3390
5ZZ	—	—	—	1655	—	1655
VK6XX	—	—	4895	3010	525	8430
6DR	—	—	—	3375	—	3375
6BE	—	—	850	1780	—	2630
6KK	—	—	2205	—	—	2205
VK7SM	—	935	2845	1245	—	5025
7DK	—	—	2470	—	—	2470
7KH	—	—	1175	—	—	1175
VK8DI	—	—	2330	1710	—	4040
VK9GN	—	410	2775	3265	—	6450
9XI	—	—	2070	1585	—	3655
9DR	—	—	1410	1655	—	3065

LISTENERS' SECTION

WIA-L2022	6956
WIA-L6021/2	745
WIA-L3042	7400
WIA-L3118	Check
WIA-L4144	7600
JWR/VK5	2820
WIA-L5065	1165
GCA/VK6	12430
RA2793	1725

NEW ZEALAND

BAND LEADERS

	C.W.		PHONE	
Multiband—				
ZL4BO	14875	ZL1KG	15560
1DV	12730	4BO	2770
1HW	12365		
10 Metres—				
ZL1DV	480	ZL1KG	480
15 Metres—				
ZL1HW	3215	ZL1KG	4055
1DV	3135	1HW	2760
4BO	2920		
20 Metres—				
ZL1HW	8715	ZL1KG	10225
1DV	7650		
4BO	6815		
40 Metres—				
ZL1ACW	4215	ZL4BO	2525
4BO	4025	1ACW	2365
2BDA	3965	1KG	800
80 Metres—				
ZL4BO	1115	ZL4BO	245

C.W.

Call	80	40	20	15	10	Total
ZL1DV	—	1465	7560	3135	480	12730
1HW	—	435	8715	3215	—	12365
1IL	—	—	6150	2590	—	8740
1AMQ	—	—	6150	—	—	6150
1ACW	—	4215	—	—	—	4215
ZL2BDA	—	3965	5820	2390	—	12175
2CD	—	685	4475	1705	—	6875
2GX	—	1550	—	—	—	1550
ZL4BO	1115	4025	6815	2920	—	14875

PHONE

Call	80	40	20	15	10	Total
ZL1KG	—	800	10225	4055	480	15560
1HW	—	—	—	2760	—	2760
1ACW	—	2365	—	—	—	2365
ZL2GX	—	645	—	—	—	645
ZL4BO	245	2525	—	—	—	2770

LISTENERS' SECTION

ZL190	10695
ZL149	10445
ZL1113	4760

OVERSEAS

C.W.

North America

W1EVT	7192 pts.	WB6PGK	4077 pts.
W2GKZ	3524 ,,	WB6IEX	2584 ,,
W3VKD	2080 ,,	W6LCX	2010 ,,
W3CBF	10 ,,	WA6GLD	304 ,,
W4NBV	5616 ,,	WA7BOA	2794 ,,
W4ORT	470 ,,	W8ZCT	5040 ,,
K4RDU	288 ,,	W9JQD	528 ,,
W4HOS	50 ,,	K9BUG	Check
W4MMD	Check	WA0KDI	1476 pts.
W5BRR	3058 pts.	K0FCR	234 ,,
W5BUK	1824 ,,	KH6IJ	19656 ,,
W5EQT/5	675 ,,	W0PAN/KH6	276 ,,
WA6EPQ	10920 ,,	KL7FRY	444 ,,
W6EWN	7455 ,,	HI8XAL	384 ,,

Europe

DL7AA	1050 pts.	OK1ALG	72 pts.
DL8KJ	840 ,,	OK1UY	36 ,,
DJ3WU	238 ,,	OK3KEU	24 ,,
DJ1UL	30 ,,	OK1AII	20 ,,
DL2LY	18 ,,	OK3CEX	8 ,,
DM3SBM	252 ,,	OK3KFV	2 ,,
DM3YYA	12 ,,	OK2BCI	2 ,,
DM4PKL	8 ,,	OK1ADH	2 ,,
DM4UJJ	2 ,,	OK1ADM	Check
DM3VTG	Check	OK1ALZ	Check
F3AT	370 pts.	OK1AHZ	Check
F8TM	90 ,,	ON4XG	360 pts.
F9OE	48 ,,	OZ1LO	432 ,,
G3HDA	1890 ,,	OZ4PM	144 ,,
G6XN	1620 ,,	OZ4H	48 ,,
G2DC	969 ,,	OZ3IB	12 ,,
G5RF	658 ,,	PA0BRA	8 ,,
G3JAG	80 ,,	PA0JPC	8 ,,
G3WP	Check	PA0MUG	2 ,,
HA3MB	90 pts.	SP3AIJ	742 ,,
HA1VE	50 ,,	SP8AJK	320 ,,
HA6NC	12 ,,	SP8ABQ	60 ,,
HA3KNA	2 ,,	SP7GH	50 ,,
I1LAO	256 ,,	SP8MJ	30 ,,
OE1RZ	1652 ,,	SP2KAC	24 ,,
OH2TI	3312 ,,	SM2CTY	259 ,,
OH1XX	1140 ,,	SM2DPB	4 ,,
OH2AC	930 ,,	SM3AGD	1199 ,,
OH5UX	528 ,,	SM3BUS	256 ,,
OH5UQ	280 ,,	SM3CXS	24 ,,
OH3MK	210 ,,	SM4CLR	20 ,,
OH6WD	45 ,,	SM5API	488 ,,
OH9QV	30 ,,	SM5BEU	54 ,,
OH5WF	20 ,,	SM5BDY	30 ,,
OH1TN	30 ,,	SM6PF	2 ,,
OH2SJ	16 ,,	SM7ANB	1280 ,,
OH6UX	8 ,,	SM0CCE	2451 ,,
OH2YV	Check	SM0BNX	744 ,,
OK3OM	304 pts.	SM0BYG/0	660 ,,
OK1AEZ	182 ,,	YO3RF	80 ,,
OK1AFN	140 ,,	YU1BCD	708 ,,
OK2QX	80 ,,		

Asia

EP2BQ	976 pts.	JA5BIA	60 pts.
OD5EJ	16 ,,	JA6AD	4416 ,,
KR6JM	1364 ,,	JA7FC	3718 ,,
KA9AK	2200 ,,	JA7FS	1404 ,,
JA1VX	1870 ,,	JA7KE	21 ,,
JA1THL	948 ,,	JA8GR	306 ,,
JA1GTF	759 ,,	JA8CJY	153 ,,
JA1DCL	55 ,,	JA9YBA	4 ,,
JA2AIR	1232 ,,	JA0AC	4125 ,,
JA4IF	1776 ,,	JA0OP	930 ,,
JA4AQR	1764 ,,	JA0BOU	360 ,,
JA5AB	7812 ,,		

U.S.S.R.

UA1KBW	1364 pts.	UA0KSB	405 pts.
UA1KBR	830 ,,	UA0LS	253 ,,
UA1KIL	360 ,,	UC2WJ	145 ,,
UA1KEO	84 ,,	UC2KAC	100 ,,
UA1OE	68 ,,	UC2WP	88 ,,
UA3KAS	3690 ,,	UC2KMZ	48 ,,
UA3KBO	630 ,,	UC2KSA	30 ,,
UA3KYA	441 ,,	UP2KNP	2242 ,,
UA3KZO	210 ,,	UP2NV	812 ,,
UA3UM	161 ,,	UP2KBA	4 ,,
UA3KAG	84 ,,	UQ2CC	585 ,,
UA3FT	64 ,,	U5ARTEK	553 ,,
UA3JD	28 ,,	UB5KED	500 ,,
UA3EU	12 ,,	UB5KLD	304 ,,
UA3OD	10 ,,	UT5WW	100 ,,
UA4KKC	364 ,,	UT5HP	80 ,,
UA4QP	196 ,,	UB5KAK	72 ,,
UA4NE	56 ,,	UT5KDP	60 ,,
UA6KAA	522 ,,	UB5ND	52 ,,
UA6KAE	156 ,,	UB5KAI	44 ,,
UA6WF	64 ,,	UB5OD	30 ,,
UA2KAP	252 ,,	UT5SH	24 ,,
UA2KAT	32 ,,	UB5RS	16 ,,
UA9KWA	960 ,,	UD6AM	200 ,,
UA9MS	270 ,,	UD6BZ	108 ,,
UW9DH	120 ,,	UL7BG	946 ,,
UW9OA	68 ,,	UL7KAA	90 ,,
UA9VQ	52 ,,	UL7IQ	12 ,,
UA9CC	44 ,,	UL7CT	6 ,,
UA9FN	36 ,,	UL7GR	3 ,,
UA9MR	30 ,,	UH8BO	27 ,,
UA0ML	737 ,,	UH8DH	12 ,,
UA0KZD	594 ,,	UI8AI	12 ,,
UW0IX	506 ,,	UM8KAA	203 ,,
UA0KCA	418 ,,		

South America

CE6EF	24 pts.	PY1CSF	590 pts.
PY2BJH	1280 ,,	PY2DBU	20 ,,
PY2CQ	1104 ,,		

Oceania

FK8AH	1032 pts.	VR2DK	2821 pts.

PHONE

North America

VP2AC	240 pts.	W6LCX	820 pts.
HI8XAL	3108 ,,	K6OVF	432 ,,
HI8LC	308 ,,	WB6CCV	204 ,,
HR1CP	462 ,,	W8YGR	20 ,,
TG8CJ	1040 ,,	W9JQD	114 ,,
KP4CL	540 ,,	K0FCR	259 ,,
W2GKZ	70 ,,	K0UKN	126 ,,
W4NBV	2424 ,,	KH6IJ	14904 ,,
W4RLS	854 ,,	KH6FRO	14144 ,,
W4MMD	Check	W0PAN/KH6	7436 ,,
WA5ALB	1065 pts.	KL7FRY	636 ,,
WA6EPQ	3726 ,,		

Asia

JA1VZM	140 pts.	JA6ATL	814 pts.
JA1RZN	132 ,,	JA7JH	1275 ,,
JA1OCA	21 ,,	JA7MA	913 ,,
JA1YIB	18 ,,	JA7CQE	225 ,,
JA1NEZ	18 ,,	JA8AIP	468 ,,
JA2HMH	320 ,,	JA8BB	36 ,,
JA2DDN	258 ,,	JA9ASQ	540 ,,
JA2BYW	224 ,,	JA9BMG	8 ,,
JA3CXN	174 ,,	JA0AC	184 ,,
JA4BJO	10220 ,,	EP2BQ	598 ,,
JA4FK	360 ,,	ZC4CN	460 ,,
JA4AQR	18 ,,	VS6FS	4508 ,,
JA6AFL	2178 ,,	KA9MF	3633 ,,

Europe

DJ8FC	3906 pts.	I1LAO	228 pts.
DL9KRA	3591 ,,	OE1RZ	2316 ,,
DL7AA	1260 ,,	OK1ADP	980 ,,
G8KG/A	1955 ,,	OZ4FA	2130 ,,
G3UML	1750 ,,	OZ9CR	8 ,,
G6XN	1729 ,,	OZ4MN	Check
OH2TI	3366 ,,	SM1CXE	8 pts.
OH2BC	3024 ,,	SM3AGD	1200 ,,
OH1VT	540 ,,	SM3BUS	60 ,,
OH2XA	192 ,,	SM5API	96 ,,
OH2AC	52 ,,	SM7SX	12 ,,
OH2BEF	48 ,,	SM0BYG/0	228 ,,
OH3XZ	Check	PA0HBO	1632 ,,
OH5UQ	Check		

Africa

CR6BX 2 pts.

U.S.S.R.

UA1IG	1320 pts.	UC2BF	72 pts.
UA1ZJ	100 ,,	UP2OK	378 ,,
UA3KBO	304 ,,	UP2NV	30 ,,
U5ARTEK	550 ,,	UH8BO	30 ,,

Oceania

KG6ALW	1680 pts.	FK8AH	245 pts.

South America

HK3BAE	55 pts.	PY2SO	1232 pts.
OA4PQ/4	1344 ,,	YV5BPJ	2180 ,,

LISTENERS' SECTION

North America

VE3-7554	Check	WPE6YL	210 pts.
WPE6GFZ	418 pts.		

Asia

K1QHP/3W8	216 pts.	JA5-231/8	40 pts.
JA1-3112	320 ,,	JA0-1320	1974 ,,
JA2-1885	1280 ,,		

Europe

DE15487-K21	1484 pts.	HE9FMO	598 pts.
SH-DL-15	585 ,,	OK3-14290	120 ,,
DL-SWL-R/T	80 ,,	OK2-6901	90 ,,
REF17735	196 ,,	ONL383	324 ,,
NL819	50 ,,	OE9CZI	32 ,,
GW7796	Check	SM2-3706	1144 ,,
HA5-146	60 pts.	SM5-2735	522 ,,

U.S.S.R.

UA1-74512	48 pts.	UA9-9721	176 pts.
UA9-2847/3	1300 ,,	UP2-21069	24 ,,
UA3-12804	960 ,,	UP2-21061	16 ,,
UA3-12982	336 ,,	UB5-5382	660 ,,
UA6-85206	504 ,,		

— . . . —

CONTEST CALENDAR

13th/14th May: N.Z.A.R.T Sangster Shield (3.5 Mc. only).
8th/9th July: N.Z.A.R.T. Memorial Contest (3.5 Mc. only).
8th/9th July: R.S.G.B. 1.8 Mc. "Summer" Contest.
12th/13th August: Remembrance Day Contest.
7th/8th October: VK-ZL-Oceania DX Contest (phone section).
14th/15th October: VK-ZL-Oceania DX Contest (c.w. section).
14th/15th October: R.S.G.B. 21/28 Mc. Telephony Contest.
28th/29th October: R.S.G.B. 7 Mc. DX Contest (phone).

Ross Hull Memorial Contest 1966-67 Results

The Federal Contest Committee presents the results of the 1966/67 Contest.

Again this year we saw a very poor response to a National Contest. When only 0.7% of licensed Australian Amateurs participate in a contest, perhaps it is time to either re-write the entire set of rules or discontinue the contest.

Comments received with the logs were most welcome. As many spoke favourably of the rules compared to previous years' rules, it is difficult to understand the apparent lack of interest and apathy on behalf of the other 99.3% who did not enter the contest.

Attached to logs were comments received from VKs 2ZFB, 3ZCK, 4ZLO, 5ZF, 5FD and 5ZHJ. In brief, below are some of the entrants' remarks.

(1) Wants points score eliminated to 50 miles and a consecutive period of days for scoring purposes.

(2) Scoring table, 51 to 100 miles on 6 metres to be 5 points, and the 432 Mc. table to be 2, 5, 10, 15, 20, 25, 50, 100, 200.

(3) Criticises the 1,000 mile scoring table, due to Brisbane and Adelaide being on the 1,000 mile mark. (Shall be changed for next contest.—F.C.M.)

(4) Anyone who operates in the Contest and submits a log with over 100 contacts should be given a certificate or some form of recognition.

(5) Thanked the Committee for running the Contest, and thought the scoring system much better, and no G.M.T. excellent.

(6) Rules and scoring quite acceptable and wants them retained for next year. Although there was a reluctance to exchange numbers locally, it does help to stimulate interest when there is not any DX.

(7) Offered constructive criticism, in that the 101-200 mile on 6 metres is a difficult path and should be worth 10 points, in fact 15 points would be more suitable he suggests.

(8) And finally a very helpful letter from the VK5 V.h.f. Group, giving their viewpoints on the Contest.

To these people who did enter the Contest we say, hope you enjoyed it, and met some new call signs. To the other 99.3%—how about entering the Contest and helping to make it more popular than it is now.

Now to the results:—

TROPHY WINNER

VK5HP—J. Lehmann

AWARD WINNERS

Section A—Transmitting Open:

	Total Score	2-Day Score
VK6LK—C. Kosina	1427	621

Section B—Transmitting Phone:

VK1VP—E. Pinikis	829	637
VK2ZFB—A. F. Birch	1362	679
VK3ZGZ—R. Ferguson	695	320
VK4ZPL—P. J. Lindsay	1076	592
VK5HP—J. Lehmann	2352	1004
VK6ZDS—R. Graham	1594	760
VK7ZAH—K. J. Hendricks	2291	775
VK8ZMR—M. Richardson	186	160
ZL3AAD—G. Alderson		700

Section C—Receiving:

WIA-L2022—D. Grantley 40

Highest Two-Day Score:

VK7ZAH—K. Hendricks 775

OTHER ENTRANTS' SCORES

Section A: Nil.

Section B:	Total Score	2-Day Score
VK1ZCG	829	637
VK2ZCF	789	437
VK2ZCT	658	290
VK2BCC	421	312
VK2TR	165	80
VK3ZCK	416	189
VK3ZVV	245	154
VK4ZAZ	1030	615
VK4ZLO	967	524
VK4ZRG	882	297
VK4ZFR	810	330
VK4ZMG	702	377
VK5ZMW	994	317
VK5ZF	848	299
VK5ZEJ	833	321
VK5FD	577	244
VK5ZMJ	525	275
VK5TN	466	215
VK5ZGF	250	—
VK5ZHJ	215	55
VK5ZNN	205	—
VK5ZKG	165	57
VK5CL	84	65
VK6ZCD	860	681
VK6ZAS	590	230
VK6ZAL	404	—
VK7BQ	280	—
VK7ZKJ	183	123
VK7ZMW	171	57

Disqualified Log: VK3ZER
Breach of Rule 9, late entry.

☆

Remembrance Day Contest

Following a decision of the Federal Convention, the new rules and scoring system will be used for this year's contest. Full details will be included in the June issue of "A.R."

The following extract from the rules indicates the method whereby the winning Division will be decided.

The Division to which the Trophy will be awarded shall be determined in the following way:

By using the equation,

$$S = \frac{P + 175\ (N - E)}{1000}$$

where S = State's trophy tally points.
P = Total score of State.
N = Total log entries received.
E = Entrants from State concerned.

VK1 scores will not be included with VK2, nor VK8 with VK5.

The Most Outstanding Transceiver Va

IN ADDITION . . .

to the latest Galaxy V. Mark II. all-band S.S.B. Transceivers, we carry stocks of the following items:—

- **SWAN SW350 all-band SSB Transceivers.**
- **GONSET 2 Metre SSB Transceivers. $400**
- **HEATH HW-32A 20 Metre single-band Transceiver Kits. $180**
- **HEATH HA-14 400 W.-plus P.E.P. output Linear Amplifier Kits. $175**
- **HY-GAIN multi-band Verticals, 14AVQ, tri-band Yagi Beams, TH3JR and TH6DX.**
- **NEWTRONICS latest all-band Vertical 4-BTV with 80 metre top-loading coil. $70**
- **WEBSTER Bandspanner, all-band, centre-loaded mobile whips with bumper or body mount assemblies. $50**
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SPECIFICATIONS

FREQUENCY COVERAGE: 3.5-4.0, 7.0-7.5, 14.0-14.5, 21.0-21.5, 28.0-29.0* Mc. (*optional crystals for other 1 Mc. ranges)

SOLID STATE VFO: Tunes 5.0-5.5 Mc. at all times, without any switching for best stability, and doubly temperature compensated and voltage regulated.

GENERATION SCHEME: 5.0-5.5 Mc. VFO mixed with 9 Mc. filter oscillator 80 and 20 metre operation, using sum-difference selection. 40-15-10 metre operation by pre-mixing VFO with correct crystal controlled oscillator, then into 9 Mc. I.F. system.

TUNING: Illuminated, two-color dial scale system with adjustable hairline fiducial. **Two speed** vernier reduction system of 12 : 1 allows fast tuning and 72 : 1 slow-precise tuning. Also includes new, precise dial logging calibration on tuning knob with adjustable hairline fiducial for high resetability resolution. Primary calibration 5 Kc. markers with 100 logging scale divisions each revolution of knob. Over 8 linear inches of dial calibration.

STABILITY: New solid-state VFO circuit has double temperature compensation and double voltage regulation for utmost stability. Drift is less than 100 c.p.s. in any 15 minute period after nominal warm-up; less than 100 c.p.s. change for 10% change of primary voltage on our power supplies.

CONTROLS: (1) Main VFO dial, illuminated; (2) A.F. gain; (3) R.F. gain; (4) Mic. gain; (5) Exciter tuning; (6) P.A. plate tuning; (7) Bandswitch; (8) Load control; (9) Sideband selector; (10) Function selector—PTT, VOX, CAL., TUNE, CW. Rear: Final bias set. Inside: "S" meter zero, VOX (if accessory installed), Gain, Anti-VOX, Delay.

TRANSMITTER: SSB 400 watts p.e.p. input; manual keying for SSB or CW, and also automatic "break-in" keying with VOX accessory on phone or CW; generating audio sidetone into speaker at all times in TUNE or CW functions; selectable sideband operation with illuminated USB-LSB indicators showing SB in use; shifted carrier CW operation to minimise "leap-frogging"; shaped grid-block keying on CW to suppress clicks and chirps; carrier suppression of 45 db. or more without frequent re-adjustment; unwanted sideband suppression of 55 db. without frequent re-adjustment; bandpass of 2.1 Kc. nominal with 1.8 : 1 shape factor, and norminal response of —6 db. at 300 and 2400 c.p.s.; ALC control for maximum "talk-power" without "flat-topping"; TUNE position for reduced power adjustment and longest tube life; high impedance microphone circuit (microphones should have —50 to —60 db. output for best results) with PTT control; adjustable pi-network output matching nominal 50 ohms and 40-100 ohm resistive range; compact size 6" high, 10¼" wide, 11¼" deep and 13 lbs. net weight.

RECEIVER: Coverage same as transmitting; preselection coupled with exciter tuning control and does not require separate adjustment; sensitivity better than ½ uV. for 10 db. S+N/N; selectivity nominal 2.1 Kc. with internal 6 crystal lattice filter (or may be reduced to nominal 300 c.p.s. with optional filter—peaked at nominal 800 c.p.s.); full AGC on received modes with fast attack, slow release, and less than 6 db. output change for 60 db. input variation, using audio derived system; nominal antenna input impedance of 50 ohms; audio response —6 db. at 300 and 2400 c.p.s. points; audio output impedance 8 ohms; audio power output 1 watt nominal.

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W.I.A. FEDERAL PRESIDENT'S SPEECH AT CONVENTION DINNER

The Official Dinner of the 31st Convention of the Wireless Institute of Australia was held at the Shoreline Motel-Hotel, Hobart, on Saturday evening, 31st March, 1967. When proposing the toast to the Wireless Institute of Australia, Max Hull, VK3ZS, Federal President of the Institute said:—

"It gives me great pleasure to propose the Toast to the Wireless Institute of Australia, particularly on this most auspicious occasion when the Federal Convention of the Institute is being held in Tasmania for the first time since 1935—a period of 32 years.

"To me the Wireless Institute of Australia has always stood for something of which I have been justly proud; something for which I have always been proud to wear its badge.

"It is true to say that since the early days of Amateur Radio, when the Amateur pioneered the bands and proved to the commercial world that short wave frequencies were something which could be used to advantage by countries all over the world, that the Amateurs' part in technical progress has been somewhat downgraded by the financial ability of big companies to pursue investigations generally beyond the capabilities of the Amateur.

"Nevertheless, I have always been most conscious of the fact that Amateurs, world-wide, can do so much for a country, that it is disturbing in this day and age to find that we are in danger of losing the valuable and already foreshortened frequency assignments which we have held for so many years, by virtue of the fact that the developing countries in the poorer regions of the world—are today growing aware of the value of communications facilities as a great asset to them. For this reason they will be requiring the use of frequency bands just as all other well developed countries already use—sometimes to our disadvantage.

"The economic growth of the world is something we cannot stop, but it is something we should be very conscious about since it will effect our hobby, and here in Hobart at this Convention we have been speaking at some length about these problems.

"The Amateur can still play a most vital role in the affairs of the countries in which he resides. This has been proven in big countries like America, England and European countries in Region I. It has been well established internationally that we are recognised as a service, but in being recognised as a service we have to contribute something for the good of the people of our country.

"It has also been firmly established that Amateur Radio—which some people downgrade as a hobby and which I agree is a hobby but a very technical hobby—has been the means by which, to quite a large extent, many western countries have progressed economically, sociologically and technologically.

"What we are afraid of today is that the new developing countries—particularly in Region III., in which Australia is located—that these people who are suddenly becoming conscious of communication facilities and the advantages of these facilities, are unaware of what Amateur Radio can do for them.

"It is true to say that throughout Australia —and I am sure, Mr. Munro, here with us representing the Postmaster General, or any other member of the Government Services which utilise frequencies, will agree—that a very high percentage of the staff carrying on the communication service of Australia are Amateurs.

"Amateurs are people who, their XYLs may call all sorts of unusual things, but they ARE people who once having taken an interest in Amateur Radio, become a technological asset to their country, because they think, eat, sleep and dream Amateur Radio.

"Some people say that, generally speaking—women are generally speaking—but in the case of Amateur Radio the OM can certainly compete with his wife when it comes to speaking, and while some people will say they speak a lot of nonsense they are also all the time adding to their technical ability. It is also true to say that a reasonably high percentage of Amateurs are engaged in other pursuits in life, all sorts of occupations outside the technological services. These Amateurs contribute to the economical and sociological growth of a country.

"I feel very strongly that Amateur Radio has a vital part to play in Australia. We have had many demonstrations of the ability of Amateurs to provide communications during times of emergency. This has been currently the case in the State of Tasmania, the host Division for this Convention.

"I will not dwell on this. I believe there were many problems and from what I have heard, all communication services were somewhat in a state of chaos in an emergency which befell people on an island of the Commonwealth of Australia where it was entirely unexpected that a disaster of such magnitude could possibly happen.

"I am proud to know that the Amateurs played a role in the communications during these times of distress and I extend, on behalf of the Federal Executive, the Federal Council and the Victorian Division, to which I also belong, the sincere sympathy to those who lost their homes and to the friends and relatives of those who also lost their lives.

"In toasting the Institute I would like to point out, mostly to the younger people—the younger Amateurs—that the problems besetting the Amateur Service world-wide are not the figment of somebody's imagination. It is something very real but I am afraid, that in Australia, Amateurs generally adopt a rather complacent attitude—'well you know we are a big continent, we are isolated from the rest of the world, the Postmaster-General's Department and the Government of Australia support an Amateur Service, so we are quite safe'.

"This is a fallacy. It is so far removed from the realistic conditions which exist, I can only point out with severe sternness that the Amateur frequencies are indeed in peril worldwide. Not so much because of the big countries where Amateur Radio is a recognised service and supported by the governments of those countries, but by virtue of the fact that the developing nations of the world are those requiring communication services and because of this they will be the people at future international conferences where the frequency spectrum is allocated on an engineering basis. These people are going to be the ones who will have a vote an equal vote—along with the countries who support an Amateur Service.

"If you look at the number of these countries which will have this vote—and therefore the same power as the bigger countries—you will realise that they could very quickly vote Amateur frequencies out of existence. Not because the countries supporting the Amateur Service will vote them out, but because the developing nations who can vote them out—or use the frequencies irrespective—will make the bands so untenable to the Amateur Service world wide that the frequencies will be quite useless even to the Amateurs who are licenced to transmit by their own administrations. This is the danger as we see it and the so called exclusive section of the 7 Mc. band is an example of it.

"Gentlemen, I hope the Wireless Institute of Australia encourages more and more Amateurs to join its ranks, because it is only by a voice which is recognised by the administration that the problems besetting Amateur Radio can be placed authoratively before a government.

"I wish the Wireless Institute of Australia every success in the future. I have great faith that the Australian Administration will continue to support an Amateur Service when it comes to discussing the assignment of frequencies for I believe Australian Amateurs have capably demonstrated their worth in this country.

"This applies also to other westernised countries where Amateur Radio is supported and where Amateurs have had the opportunity to demonstrate to their people how they can conduct emergency operations and provide other useful services in the national interest.

"I ask you to charge your glasses, be upstanding and drink the toast of the Wireless Instiute of Australia."

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W.I.A. FEDERAL PRESIDENT'S REPORT

MARCH 1966 – MARCH 1967

Gentlemen! It is again a pleasure to present my report to the Federal Council, this time on the occasion of the 31st Federal Convention of the W.I.A. being held in Hobart, Tasmania, for the first time in more than 30 years.

The Federal Officers you appointed to the Executive at the conclusion of the 1966 Convention have carried on the good work of the previous year and it has been my pleasure to work with them as Chairman and President.

The use of the Headquarters Division's rooms and facilities in Victoria Parade, East Melbourne, has been a great asset, providing a more central meeting place for the Executive where all records are to hand when required and generally proving to be more suitable than the past system of meeting in the homes of Executive members.

The arrangement this year, too, of sharing the services of an office stenographer with the Headquarters Division, in addition to the Division's Administrative Secretary, has been most helpful in dispensing with a lot of routine work, leaving the Officers free to carry on with more important tasks. The cost of this arrangement has not been great and has certainly been worthwhile. However, it is an additional drain on Executive funds and the experimental period will need to be watched closely so that value will be gained from the arrangement.

MEMBERSHIP

Costs being met in the overall operation of the Institute have risen in most directions and have had to be watched closely by the Divisional and Federal Treasurers. As I have stressed so many times, membership is the vital factor controlling what the Institute can do and what it can't do. Without a growing membership we will meet difficulties in dealing with increased running costs. Over the last twelve months there has been no spectacular rise in membership except in the VK3 Division where full members rose from 902 in 1966 to 1046 in January 1967, an increase of 144 on the figures available.

Some Divisions have not been complying with Federal policy regarding membership returns, a matter I trust will be rectified from now on, particularly if the proposed Federal Constitution is agreed upon where accurate figures will be important in the financial involvement. However, although not absolutely accurate, the following figures will indicate some interesting points in relation to the membership position:—

	Full	Assoc.	Total
VK2	877	396	1273
VK3	807	239	1046
VK4	303	174	477
VK5	388	205	593
VK6	237	66	303
VK7	151	81	232
	2763	1161	3924

The following is the total of VK licensees:—

	Full	Limited	Total
VK1	66	11	77
VK2	1283	385	1668
VK3	1114	482	1596
VK4	445	148	593
VK5	474	198	672
VK6	261	121	382
VK7	124	63	187
VK8	13	4	17
VK9	59	7	66
VK0	3	–	3
	3842	1419	5261

Of the 5261 current licensees in the Commonwealth and Mandated Territories, 2763 are members of the W.I.A. This represents 52.5%, which shows a small increase in favour of the W.I.A. compared with previous years, but, I believe, and I have said this many times before, that the Federal Council should evolve a membership drive process as a continual part of this organisation to encourage Amateurs to become members of the Institute which protects their interests, even if it means spending money to achieve the required results. The Amateur Radio brochure mentioned previously could be considered step one in a project of this nature.

It is interesting to note that the licensee figures have shown a steady increase of around the 400 mark each year for some years past. I believe that this can be substantially increased by the introduction of Novice licences and a wider activity with the Youth Radio Scheme outside of N.S.W.

The minutes of the 1966 Convention held in Brisbane were completed in record time again this year and circulated to Federal Council in a little over one month. I would like to record my thanks for the assistance given by Federal Vice-President Harold Hepburn in making this possible.

The Federal Secretary and other Federal Officers have taken action on most of the items arising although, as anticipated by the Executive, there are a few directives of the Federal Council each year which must, of necessity, take more than a year, in fact sometimes several years to complete.

The "Australis" Satellite Project agreed to last year has not progressed quite as fast as expected, due to a number of delays for technical reasons, but as at the time of writing I believe the major problems have been overcome and we can expect arrangements for the "launch" will be completed in the near future. A further report on this project will be presented during the proceedings of the Convention.

The "Amateur Service Brochure" agreed to last year (Item 3.3) has not been completed but should be available to Divisions shortly after the work of preparing for, and producing the minutes of, the 1967 Convention. Two members of the VK4 Division forwarded some rather worthwhile suggestions for improving the draft submitted to Federal Council last year and I can only state that the delay is due entirely to my own lack of time to complete the introduction of these suggestions.

REGION III. PROBLEMS

A considerable amount of ground work has been covered in relation to Region III. problems as embraced last year in Items 4.2, 4.3 and 4.4. The Federal Council received a report during the year prepared by Federal Vice-President Hepburn which estimated the cost of holding a Region III. Conference. This matter will receive further attention during this Convention and the Federal Councill will be brought up-to-date on current thinking. I believe the W.I.A. must make up its mind in the next twelve months which way it is going to move, whether a Region III. Conference is a practical possibility or whether other means should be found by which to enhance the Amateur Service in this part of the world. As New Zealand points out, there is the danger that a Region III. Conference could consist of countries who are already in liaison with each other and fully understand the problems the Amateur Service is facing on a world wide basis, in which case the finance involved would be better spent where it will achieve more. On the other hand, I believe a Region III. Conference would be well worth while if it could be anticipated that the majority of Region III. countries where Amateur Radio is permitted could attend.

In response to Item 4.5 of 1966, several Amateurs were given letters of introduction to overseas Societies in Region III. and quite important information has been collated as a result of these visits abroad. I have personally been corresponding with Harry Burton, ZL2APC, the President of the N.Z.A.R.T., as a result of which I believe our two Societies are moving closer together. A further report by the N.Z.A.R.T's Overseas Liaison Officer, Tom Clarkson, ZL2AZ, will be discussed during the proceedings of this Convention.

40 METRE BAND

The case for the submission for the restoration of the segment of the 40 metre band between 7.15 and 7.3 Mc. has been given some attention. It is a most difficult assignment and not easily resolved, and I believe it unrealistic to anticipate that the Australian Administration would change the conditions of its signature to the minutes of an International Telecommunications Conference unless such a change was made by Australia at the next I.T.U. Conference dealing with this section of the spectrum. The matter will be further discussed during the proceedings of this Convention.

Referring to the matter of the new Handbook for Guidance of Radio Operators in the Amateur Service, I can only express my disappointment that this is not yet available. Matters reported at the last Convention as still requiring resolution were dealt with to the satisfaction of the Institute shortly afterwards. The delay is reported to be due to the necessity of having to change certain sections of the Wireless Telegraphy Act which can only be done by an Act of Parliament. I am currently advised that this has been completed and the matter is now in the hands of the Parliamentary Draftsman.

FEDERAL QSL BUREAU

The Federal QSL Bureau continued to function throughout the year in its usual quiet efficiency under the management of Ray Jones, VK3RJ. However, it is with sincere regret that I have to report that the Executive received Ray's resignation after 34 years' service in the capacity of Federal QSL Manager. This, to my mind, is an exemplary service deserving the commendation of the Federal Council, the Divisional Councils and members alike.

I wish to take this opportunity of saying "thanks" on behalf of the members of the Executive, past and present, for an onerous task carried out with an unexcelled devotion. Although Ray is prepared to carry on until such time as other arrangements are made, the report from the Federal QSL Bureau presented to this Convention is the last under the penmanship of VK3RJ. We wish him well in his retirement and that the continued good health enables him to enjoy Amateur Radio to the full.

At this point I would also like to express my appreciation for the work carried on during the year by the Federal Awards Manager, Alf Kissick, VK3KB; Federal S.w.l. Officer, Eric Trebilcock, WIA-L3042; and the Federal Contest Committee under the managership of Neil Penfold, VK6ZDK. Reports from these Officers will be presented to Federal Council.

PUBLICATIONS COMMITTEE

The Publications Committee of the Headquarters Division has again done a remarkable year's work, maintaining the now traditional high standard of the Institute's magazine, "Amateur Radio," to which, again, have been added some changes in format resulting in improved reading for members and non-members alike.

The Australian Radio Amateur Call Book was produced in a new format for the 1966-67 edition and this excellent publication has earned high praise already from operators, who find it an asset to be able to lay the book flat down and open at any page without the inconvenience of it springing shut as did the earlier octavo-sized editions.

A full report and balance sheet will be presented to the Convention by Mr. Ken Pincott, VK3AFJ, who will be attending on behalf of the Publications Committee. I would like to take this opportunity of expressing, on behalf of the Federal Council and the Executive, my appreciation for the immense amount of work carried out by the Committee in maintaining the Institute's publications, and to all those who contributed the articles and notes which made the publication of "Amateur Radio" possible.

YOUTH RADIO SCHEME

At the time of writing this report I am unable to say whether there will be a report from Rex Black, VK2YA, Federal Co-ordinator of the Youth Radio Scheme. Rex and his XYL have gone abroad to the U.K. for an undisclosed period and it was my pleasure to give him a letter of introduction to the R.S.G.B. and other overseas Societies. However, in a letter I received recently, Rex advised me that Y.R.S. has had steady progress and developing interest during the year; a number of licensees have been gained from the ranks of Y.R.S. students and considerable development has taken place in N.S.W. with the Postal Group system of training. I am advised that the N.S.W. Government is offering $20,000 subsidy to youth movements and the N.S.W. Division is currently applying for this for the further development and expansion of Y.R.S. in that State.

Rex Black has always been an advocate for Novice licences and he is of the opinion that without these Y.R.S. cannot achieve its maximum effectiveness. On the othr hand, he is uncertain that the American system meets the requirements of Y.R.S. and that possibly an "instructional" type of permit with far greater supervision by acceptable licenced Amateurs

and close scrutiny of the construction of transmitters, installation and operation, should be considered.

Leave of absence has been granted to Rex for the period of his stay abroad and it will be necessary for the Federal Council to appoint someone to replace him during his absence.

The matter of duty and sales tax applied to equipment specifically for use by Amateurs has been progressing slowly and this will be discussed with delegates during the "open session" of the Convention proceedings. Valuable co-operation with this and other matters is being given by the Hon. Allen Fairhall, M.H.R., who has regularly been in touch with the Executive. He is also currently operating s.s.b. after some years of inactivity and this is enabling him to regain an up-to-date knowledge of the advancing Amateur Service which will be of great benefit to the Institute, during future negotiations in relation to these problems.

W.I.C.E.N.

The Wireless Institute Communication Emergency Network (W.I.C.E.N.) has accounted well for itself over the past year, particularly in Tasmania during the disastrous Hobart fires when Amateurs again showed their merit in providing communications during an emergency where normal communications were severely handicapped or non-existent.

The full story of the VK7 Amateurs may never be told in its entirety for individual acts become just part of an emergency of this magnitude. Part of the story will be told in the pages of "Amateur Radio," a story where once again Amateurs played a leading part in demonstrating to the public and the Government the value of Amateur transmitters.

In Victoria the W.I.C.E.N. organisation has been granted the use of two motor vehicles by the Victorian Government for use in conjunction with State Emergency Organisations. These are currently being equipped by the Victorian Division and will include telephone patch facilities along with modern v.h.f. equipment, power supply equipment, operating tables, antenna equipment and other devices which from experience are required for emergency communication work. I believe this to be ample evidence of the high regard placed on the W.I.C.E.N. organisation by the authorities and is a tribute to those members of the Victorian Division who have worked so hard to achieve something so worthwhile in the public interest.

TRIBUTE TO AMATEURS

It is not possible in a brief report of this nature to write in detail the various activities of Amateurs which do justice to the hobby of Amateur Radio. But before concluding this section of my report I would like to pay a tribute to a few Amateurs who have been involved in record breaking activity.

On November 28, 1966, Ray Naughton, VK3ATN, created a moonbounce record by working K2MWA/2—a distance of 10,400 miles on 144 Mc. Nine months of planning and hard work went into this effort and Ray is to be congratulated on coupling Australia at the top of the list in this most advanced field of communication. A second contact was made on December 29, 1966, with K6MYC over 7,000 miles.

Another fine achievement was a record 402 miles between I. F. Berwick, VK3ALZ, and M. J. McMahon, VK5ZDR, on 432 Mc. between Melbourne and Adelaide.

There has also been some experimenting going on at 1296 Mc. and although not a VK3 record, a contact was satisfactorily completed by VK3ALZ and VK3AUX/3 on 10th April, 1966, over a path of 25.6 miles.

At the other end of the spectrum, I find some most interesting work has been carried out for the last three or four years with trans-equatorial long haul DX in the 160 mefre band by Jack de Cure, VK5KO, since his retirement from the P.M.G. Department. 120 watts into a 50 ft. vertical ground plane has resulted in six European QSOs, 6 Asian QOs, 2 African QSOs, and 61 North American QSOs on 1820 Kc. over paths of up to and over 6,000 miles. A very fine effort and I trust Jack obtains a South American contact to obtain his W.A.C. on 160 metres.

With the approach of the peak of the solar cycle, conditions on the DX bands have been excellent. S.s.b. is really showing its merits and countries rarely heard during the dip of the solar cycle are now frequently heard. This condition increases Amateur activity which capably illustrates the potential of Amateur Radio to the world at large.

In step, the conditions have also improved on the v.h.f. bands with good JA contacts on 52-54 Mc. in the northern part of Australia; contacts between VK3 and VK4, and VK2 and ZL on 144 Mc. over paths in excess of 1,000 miles; and an incidence of a growing use of transistorised equipment in the 432 and 1296 Mc. bands. I believe the next year will provide even better conditions and this will be a good time for encouraging complete use of the Amateur Service frequency assignments.

It is activity like this which has built up the history of Amateur Radio, and talking of history leads me to record my appreciation of the work carried out by the Federal Historian, George Glover, VK3AG, who has compiled a precis of his work for presentation to each Federal Councillor. These documents are not chronologically complete and I would request Federal Councillors to make an effort to unearth old records which will assist in bringing our history up to date.

Whether intended or not, in this day and age contests are the most effective instrument we have for encouraging Amateurs to use the bands. Unfortunately, statistics indicate that, despite a growing licensee figure, participation in contests is falling. There must be a reason for this and I strongly suggest that Federal Council give this matter serious attention. Aspects of various contests will be discussed during the Convention proceedings.

In general, the Institute has had an active year. Its membership has grown, the overall licensee figure has increased despite the sad passing of a number of the older licensees which have been recorded in the magazine; and overall I believe we can look forward to a prosperous era in Amateur affairs generally.

INTERNATIONAL SCENE

Turning now to the international scene of the Amateur Service.

It is gratifying to note a concerted action by the International Amateur Radio Union (I.A.R.U.) to promote Amateur Radio on a world-wide basis, particularly in the under-developed countries, and a consciousness of the grave dangers confronting Amateur Radio from the countries which, technically, are awakening to the advantages of communications but know little or nothing about the Amateur Service and its advantages.

Two years ago the A.R.R.L. contracted with the Stanford Research Institute to conduct an overall appraisal of the Amateur Radio Service. This extensive report was recently completed and circulated to all Societies through the I.A.R.U.

I have a copy to present at this Convention and, although I must confess some disappointment that the report predominates in Regions I. and II. and not very much in Region III., it is indeed one of the most powerful documents I have ever read supporting Amateur Radio. Its intention is to explain to government officials around the world the advantages of having and maintaining an Amateur Service. A spare copy has been made available to be presented to the appropriate head of communications, and limited additional copies are available.

The I.A.R.U. is now 72 Member Societies strong, including six new members during last year—Algeria, Cyprus, Czechoslovakia, East Africa, Liberia and Nicaragua. Robert W. Denniston, W0NWX, was appointed President of the A.R.R.L. and the I.A.R.U. last May, Wayland M. Groves, W5NW, continuing as Vice-President, and John Huntoon, W1LVQ, as Secretary.

Part of the programme of I.A.R.U. and the Headquarters Society (A.R.R.L..) has been personal visits by staff members to Europe, the Middle East, Latin America and the Far East. President Denniston was scheduled to visit Australia about the time of this Convention and I was hopeful that he would be able to include Hobart in his itinerary. Unfortunately the Executive received advice of the trip being temporarily cancelled due to Mrs. Denniston being ill, but we are looking forward to meeting him later in the year.

This programme of travelling is to encourage the growth of Amateur Radio world wide, particularly in countries where it is unknown or not yet firmly established, by liaising with Amateur groups and clubs, and with individuals in various countries, providing and distributing literature and providing various items of basic training equipment for groups who are sponsoring training classes for new Amateurs. I see in this activity a kind of "international Y.R.S." and I believe it to be a step in the right direction towards the essential preservation of Amateur Service frequency assignments. However, there is a limit to what the Headquarters Society and the I.A.R.U. can do and both organisations are asking for help from other Societies, particularly in areas where the training materials must be in a language other than English, and suggest that other Societies could "adopt" a particular country and work vigorously toward promoting the growth of Amateur Radio. I believe that the W.I.A. and the N.Z.A.R.T.. should give serious thought to playing their part in Region III.

A few evenings prior to this Convention, members of the Executive entertained Harry Yoneda, JA1ANG, who was travelling in Australia on business and had been "commissioned" by the President of the Japanese Amateur Radio League (J.A.R.L.) to make contact with the President and Executive of the W.I.A. to discuss the Amateur Service in Region III. The meeting was duly arranged by Allan Elliott, VK3AL, who acted as an ambassador of the W.I.A. during a trip abroad last year and had been entertained by the members of the J.A.R.L.

Harry Yoneda speaks perfect English and the discussions with him will go a long way towards breaking down the language barrier and providing an avenue for "talking" with Japan on the problems confronting the Amateur Service and the desirability or otherwise of holding a Region III. conference.

It was surprising to find that the general membership of the J.A.R.L. are blissfully unaware of the problems arising by virtue of developing countries in this Region having no knowledge of or consideration for, the Amateur Service.

I am of the considered opinion that whilst there is danger of the loss of bands within countries where Amateur Radio flourishes, making it necessary for Amateur Societies to maintain close liaison with their respective administrations, the real danger is that of developing countries who are unaware of the advantages of an Amateur Service—

(a) Eventually gaining substantial voting power at I.T.U. Conferences;
(b) Using frequencies within the bands allocated to the Amateur Service because they are not signatory to I.T.U. Conference agreements; and
(c) That because of the indiscriminate use of frequencies by developing and non-signatory countries, the effective use of the bands in countries supporting an Amateur Service will be severely curtailed by inconceivable interference if not rendered completely useless.

I believe therefore, that whilst a Region III. conference initially is a laudible enterprise in order to bring the Region III. Societies together for the purpose of mutual understanding of the problems involved, we must also determine how we can assist the I.A.R.U. in developing Amateur Radio in the countries which in the future will be an extreme danger to the hobby of Amateur Radio world wide.

In conclusion, gentlemen, I welcome you all to this, the 31st Federal Convention of the Wireless Institute of Australia. This year I trust will see the introduction of the proposed Federal Constitution which I believe will be a turning point in the overall administration of the W.I.A. to make it a more effective organisation to represent the Amateur Service in this part of Region III.

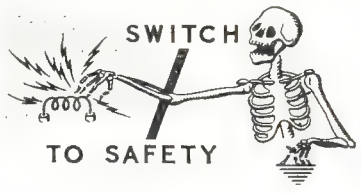
I thank you for re-appointing me as Federal President for the year 1967-68 and I will continue to devote the working time of the Executive to the task you have given it.

By the end of 1968 I will have been an active member of the Federal Executive for 18 years and I regret I will not be standing for election at the conclusion of this year's term of office. It has been a pleasure to me all these years to see the Institute and the Amateur Service grow to its present status, and I am sure that this growth will continue in the capable hands of younger and more energetic people. The Institute has an important role to play in the future affairs of the world's greatest hobby. With men of calibre and broad thinking at the head of its administration, it will carry out its function for the preservation of that hobby. In this I have great faith.

If my years of experience can be of any assistance to the Executive of tomorrow I will be most willing to be co-opted for specific duties.

Thank you, gentlemen,

—G. Maxwell Hull, VK3ZS,
Federal President.



BALANCE SHEET
as at 28th February, 1967

1965/66			1966/67
	CURRENT ASSETS:		
$6013	Commonwealth Savings Bank Federal Executive Account	$6600.28	
280	Publications Account	637.11	
75	Sundry Debtors	552.72	
310	Stock on hand—at lower of cost or market value	361.72	
	Prepayments—Convention	49.00	
			$8200.83
$6678			
	FIXED ASSETS:		
984	Furniture, Fittings and Equipment—at cost less depreciation		1209.81
$7662			$9410.64
	LESS—		
	CURRENT LIABILITIES:		
$572	Reserve Fund	$752.00	
3373	I.T.U. Fund	4222.03	
—	Australis Project	57.76	
—	Prepayments—Publications	13.20	
			5044.99
$4125			
	ACCUMULATED FUNDS:		
3106	Balance, 1st March, 1966	$3538.52	
431	Add Surplus of Income over Expenditure	827.13	
$3537			$4365.65

AUDITORS' REPORT

We have examined the books and vouchers of the Wireless Institute of Australia (Federal Executive) for the year ended 28th February, 1967. In our opinion the accompanying Balance Sheet is properly drawn up so as to give a true and fair view of the state of affairs of the Federal Executive as at 28th February, 1967, and the attached Statement of Income and Expenditure is properly drawn up so as to give a true and fair view of the results for the year ended 28th February, 1967.

Melbourne, 21st March, 1967. Hebard & Gunning, Public Accountants.

STATEMENT OF INCOME AND EXPENDITURE
for Year ended 28th February, 1967

1965/66			1966/67
	INCOME:		
$130	Interest Received		$146.68
1017	State Contributions—per capita		1115.70
285	Profit Publications and Subscriptions		495.31
$1432			$1757.69
	EXPENDITURE:		
$32	Audit Fees	$31.50	
—	Advertising	36.00	
134	Depreciation	136.00	
—	Entertainment Expenses	81.80	
—	Federal Awards Committee	5.56	
66	Federal Contest Committee	29.05	
52	Federation Expenses	12.00	
—	Floral Tributes	5.00	
21	Gifts	32.00	
6	General Expenses	73.38	
16	Insurance	16.07	
—	Oscar Project	12.51	
2	P.M.G. Licence	2.00	
48	P.M.G. Submission	—	
30	QSL Bureau	54.00	
46	Repairs Office Equipment	12.70	
6	Subscriptions	10.40	
299	Stationery, Printing	189.71	
173	Telephone, Postage	70.86	
—	Wages, Office	100.00	
70	Youth Radio Scheme	20.02	
$1001			$930.56
$431	**Surplus of Income over Expenditure for year**		$827.13

STATEMENT OF MOVEMENT OF FUNDS
for Year ended 28th February, 1967

1965/66			1966/67
	INTERNATIONAL TELECOMMUNICATIONS FUND		
$2328	**Balance**, 1st March, 1966		$3372.85
	Add Contributions:		
572	New South Wales	$300.00	
—	Victoria	—	
—	Queensland	453.00	
256	South Australia	96.18	
16	Western Australia	—	
200	Tasmania	—	
			849.18
$3372	**Balance Carried Forward**		$4222.03
	AUSTRALIS PROJECT		
	Contributions:		
	New South Wales		$80.00
	Victoria		70.00
	Queensland		72.00
	South Australia		50.00
	Western Australia		70.00
	Tasmania		20.00
	Donations—VK6 V.h.f. Group		25.00
	Other		10.00
			$397.00
	Expenditure		339.24
	Balance Carried Forward		$57.76

CONVENTION FUND 1966

1965/66			1966/67
	RECEIPTS:		
—	Bank Interest		$2.20
	Amounts from Divisions and Others—		
$869	Recovered		2030.32
—	Recoverable		277.20
$869			$2309.72
	EXPENSES:		
$351	Fares	$1258.80	
81	Accommodation	285.50	
124	Official Dinner	150.73	
102	Other Meals	228.41	
—	Freight and Other Sundries	59.55	
158	Typing Minutes	247.50	
53	Postage, Telephone and Stationery	43.64	
—	Tapes	11.59	
—	Rental Convention Room	24.00	
			$2309.72
$869			$2309.72

PROJECT AUSTRALIS NEWSLETTER

We must apologise for the lack of newsletters about the progress of the Australis satellite. In the future, these newsletters will be published approximately every two months, with special, additional ones being prepared as the need arises.

Australis has not yet been shipped to Project Oscar headquarters in California. While it had been hoped that the satellite would be in the United States by this time, a number of technical difficulties have arisen, which have delayed the completion of the satellite.

The most serious problem was in the satellite's command receiver. The receiver had to be re-built, and this, together with troubles in both the h.f. and v.h.f. transmitters, caused several months delay. However, we are pleased to be able to report that these difficulties have now been overcome, and that it is expected that Australis will be sent to California during the second half of May. Results of electrical and environmental tests will be published in later newsletters.

Electrical tests conducted so far, with the 29.450 Mc. and 144.053 Mc. transmitters indicate that the h.f. transmitter has an overall efficiency of 60% at 15 volts, and the v.h.f. transmitter, an overall efficiency of 32% at 15 volts. It is expected that h.f. transmitter will have an average power output of about 250 mW. and the v.h.f. transmitter approximately 100 mW. The satellite should operate for two to three months.

We wish to stress to recipients of these newsletters that although Australis will be sent to Project Oscar in May, it may be several months before a ride into orbit can be arranged by Project Oscar, with the launching authorities.

Project Australis has received correspondence from interested Radio Amateurs in many countries, including England, New Zealand, Ireland, Japan and the Netherlands, expressing a desire to participate in tracking the Australis satellite. This interest is most welcome, as it is only by the participation of Amateurs throughout the world that the project can be a success.

PRINTED CIRCUITS AID AUSTRALIAN INDUSTRY!

Applications for printed circuits from Precision Windings in industry are growing daily . . . it's simply amazing how many leading electronic and design engineers specify "Precision Windings" boards. PW's photographic process **does** have many advantages . . . small numbers may be manufactured economically . . . definition and detail are crisp and clear . . . negatives are readily available for alterations . . . and tarnishing is prevented by a protective over-coating. Above all the PW process offers quality control at every stage of manufacture. This is why more and more industrial organisations are coming to Precision Windings for up to the minute technical advice and prompt, dependable deliveries.

AND FOR THE HOBBYIST?

Don't worry . . . we're not neglecting our many friends who want a single circuit board. Send for our free folder on "How to prepare artwork" and for our price list. It matters little if you want one or a thousand boards . . . PW's price is most attractive. Many "Electronics Australia" designs are kept in stock and delivery is immediate. Special printed circuits are normally despatched within 7 days of receipt of your artwork. Artwork aids in the form of Solder Lands, Black Crepe Tapes, Clear Film and Transfer Letters are also available from Precision Windings at low cost. Write now!

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ARE YOU FAMILIAR WITH "73"?

"73 Magazine" was founded in 1960 in an effort to provide the Amateur with up to date reading material on the state of electronics. As most of you know, most of the Amateur journals are full of operating news, DX columns, and "who did what to whom." On the other hand, "73 Magazine" is devoted to the credo that Hams like to build, like to experiment and are interested in trying out new circuits. If you look through the last five years of "73," you will find over 2,000 technical articles. Right now "73" averages 35 technical articles per month; more than most of the other Amateur magazines put together.

It doesn't matter whether your primary interest is in SSB, RTTY, VHF, microwave, valve, transistor or integrated circuit, every single month the staff at "73" tries to have something for you. In addition, many electronic developments were first introduced to the Ham fraternity from the pages of "73," including field effect transistors, UHF transistors and integrated circuits.

If you haven't seen a copy of "73," write to us here in New Hampshire, we'll be glad to send you a free sample. If you have seen "73," you are probably thinking that a subscription is expensive. No, it isn't. Why? Because we want you to try it and become addicted. $5.00 U.S. per year world wide. VK Amateurs may subscribe direct to "73 Magazine," Peterborough, N.H. 03458, U.S.A., or through W.I.A., P.O. Box 36, East Meibourne, C2, for $A4.50.

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SWL

Sub-Editor: D. GRANTLEY, WIA-L2022
P.O. Box 222, Penrith, N.S.W.

What is this S.w.l. thing all about? This question was asked of me by an Amateur some time ago and coupled with several rather elementary queries which have arisen from time to time, I thought that maybe a few words in this column may be of interest to newcomers, and others who are not fully aware of what the S.w.l. does.

The Short Wave Listener (S.w.l.) derives his interest from searching around the various bands in order to hear as much as he can of the particular section he is interested in. There are three major sections of the bands, the Amateur Radio operators who operate within certain segments of the spectrum allotted to them for that purpose; the commercial broadcasting stations; and those providing communications or associated transmissions. The Wireless Institute of Australia, which publishes this magazine, caters for the needs of the group of Amateur Radio operators and listeners to the Amateur bands in this country, and has its counterpart in every country of the world. The facilities of the W.I.A. do not cover commercial broadcasting, and anybody interested in listening to these stations are advised to contact one of the clubs catering for this section of the hobby.

Briefly, the bands allocated for world-wide Amateur use are 160 metres, which is a medium frequency band, 80, 40, 20, 15 and 10 metres known as high frequency bands, and the very high frequency bands of 6 and 2 metres. As well there are several ultra and super high frequency bands which are not normally of interest to the listener. The aim of the S.w.l. is to listen to these bands for new and interesting calls, each of which has a special "prefix" allocated to its country of origin. Thus Amateurs in Australia use the international prefix VK, followed by a number representing their State, and two or three letters to complete the call sign, which is allocated by the P.M.G's Department.

A log showing all stations heard is kept; this shows date, time (in G.M.T.), station transmitting, station which he is working, band and mode of operation as well as details of signal strength, readability, and in the case of a Morse c.w. signal, the tone. These are given numerically, in the case of readability this is graded from 1 to 5, the high figure representing the best signal in all cases. Signal strength is given in a range of 1 to 9, as is the tone of c.w. signal. Thus a 5 by 9 signal report would mean that you could read the "contact" at maximum possible strength, in its entirety.

In order to obtain proof of reception, the listener then sends a report to the station which he heard. This can be in the form of a letter, but is usually in the form of a specially printed card. These cards can be sent direct to the station or for a small fee, the W.I.A. will forward it through their QSL bureau to the bureau of the country concerned. They in turn will arrange for it to be passed on to the operator.

Many awards are available for the collection of these cards, for instance the W.I.A. issues a Century Club award for proof of reception of 100 countries, and the I.S.W.L. in London makes available to their members awards for hearing all American States, 50 European countries, ten stations in each of the six continents, 50 British Commonwealth countries, and finally one for each of the 40 Zones into which the world is divided for Amateur Radio.

There are three ways in which Amateurs can communicate, by Morse code (c.w.), ordinary speech (a.m.) or single sideband (s.s.b.), the latter requires at least a very stable beat frequency oscillator in the receiver before the transmission can be "resolved".

What do we use for reception of these signals? Well, every listener has his own likes and dislikes in this matter. It is quite possible to get extremely good results on c.w. from a small regenerative receiver, but for serious listening, a good quality communications receiver is needed. This can be one of the several medium-priced Japanese receivers now on the Australian market, maybe one of the more expensive American ones, or as most of us do, try and get a good wartime receiver such as the AR7, SX28, BC342, BC348, H.R.O., etc. These are reasonably priced and regularly advertised by members through the advertising columns of this magazine.

A good antenna is advisable, height being more important than length. I normally try for about 30 to 40 feet of height and 60 to 100 ft. of length. To the newcomer to this hobby, should you have any query about the W.I.A. or services available in your State, contact me at the above address, and if I cannot answer your query myself, it will be passed directly to the Secretary of your State S.w.l. Group.

I hope our senior members have been patient, but I feel that quite often we go along with our notes, talking about what we have heard and done without giving a thought to the young fellow who picks up a copy of "A.R." and wonders what it is all about.

NEW SOUTH WALES

The annual meeting of the VK2 S.w.l. Group was held on Friday, March 17, and the following officers were elected: President, Gerard Gilet, L2264; Secretary, Chris Middleton-Williams; Publicity Officer: Mac Hilliard; QSL Officer, D. M. Grantley, L2022. The offices of Vice-President and Liaison were held over until the April meeting.

VK2 S.w.l. QSL Bureau: The new format for card handling will be thus: Upon the appointment of a new QSL Manager for VK2 Division, I will immediately contact him and arrange for him to send all S.w.l. cards to me at Box 222, Penrith. As it has been pointed out, I live 70 miles from Sydney and regularly work until 8 p.m. on Friday night, making attendance at meetings rather difficult. However, in order to provide a better deal for S.w.l's, all inward cards will be mailed direct to **members** every week without need of an envelope. However, non-members of the W.I.A. will be required to leave a s.a.s.e. if they want their cards forwarded on. Country members' cards will be mailed regularly free of charge. Arrangements are in hand for cards from two major overseas S.w.l. sections to have all cards mailed direct to me for distribution, thus avoiding double or in some cases triple handling. Full information will be given when this eventuates. It is possible also, that an outwards bureau will be made available free of charge to interested VK2 listeners. More anon.

BAND CONDITIONS

March has given us some of the best band conditions experienced since the boom years of the late 1950s. Ten metres has been heard wide open here in Sydney at 11 pm local time, working into Europe, whilst 15 mx usually has some good DX 20 of course is never closed, and whilst 40 is marred by commercials, 80 and 160 are far too noisy, although occasionally an early morning European is logged on 80 c.w.

AROUND THE SHACKS

Bryan Prosser of VK6 is about to take off on a six months' working trip of the eastern States, and thus our last link with that State is broken. How about a word or two from L6003? Thanks to Bob 6BE for a QSL on behalf of one of our I.S.W.L. colleagues. Bob by the way will answer all S.w.l. reports.

Doug Head, of South Yarra, who has been on several of our Round Robin tapes, had the misfortune to be robbed of his record collection during the recent heat wave in Melbourne. This is a big loss to any record collector, but more so to the tape enthusiast, who uses recorded music as a background to his messages.

Warwick Smith was fortunate in receiving cards from the following on his return: 9J2GJ, 4X4JU, LA4DJ, HB0ABS, 5Z4JW, ZC4CI, YU-3LC, HK5JS, DL9OH and SV1BI His current score is 215/154. Letter to hand from Bob 6BE in answer to an SOS from one of the I.S.W.L. S.w.l's for a Zone 29 QSL. Bob is one of the small band of Amateurs who always acknowledges an accurate S.w.l. report. Mac Hilliard has been getting good results on 15 and 10 metres, with good openings to Europe on the former. His score is now 250/102.

L2022 has seen very little activity over the past month. Restricted to 20 and lower, the loggings have been average, with an odd ZS being heard in the late afternoon and some of the rare Central Mediterranean calls being logged with some North African ones at about 4 a.m. local time. Most of the gear here has been disconnected and packed preparatory to being moved and at the moment a Philips No. 4 and an AR7 set on 20 metres are in use. Score here is 303/157.

Ernie Luff over in VK5 is still hearing most everything which is to be heard. Unfortunately his report to me for this month has been mislaid in the rush, sorry Ern, but this sort of thing can happen.

TAPE NEWS

As mentioned recently, the Newark News Radio Club have re-opened their tape section and all interested are urged to contact Bob Fowler, 155 Baldwin St., Bloomfield, New Jersey, 07003, U.S.A., for further information. The number of S.w.l's who are in regular contact by tape from various countries is surprising, many of them being anxious to have VK contacts.

I.S.W.L.

In response to several queries about the International Short Wave League, here is a brief run-down of this Society. Founded in 1946 with the object of bringing together those in various countries with the common interest of radio, whether S.w.l., Amateur, commercial, tape, or any allied field. The Society has now grown and there are members located in every major country. Upon being received as a member, the person concerned, regardless of whether he is a licence holder or not, is issued with a call prefixed by his own call area and followed by a number. The QSL bureau is unique, report sheets can be attached to QSL cards and the bureau is cleared weekly and all inward cards are mailed regularly to members, free of charge.

Services available are: Tape, translation, commercial identification, broadcast station identification, as well as stationery, blank QSL cards and a stack of awards and contests for members. The services are particularly good for those interested in commercial DX, and the monthly magazine, "Monitor" contains a wealth of Amateur DX information, as well as full details of commercial goings on. All services are free, members are expected to remit return postage on any queries, and the annual sub. of 35/- stg. is extremely good value. For further information, contact Mr. Bernard Brown, 60 White St., Derby, England.

Following the poor response from members with information for this column, I make the following suggestion. If you are an active S.w.l. on the Amateur bands only, I will be pleased to hear from you by letter, tape (twin track two speed), or by phone to Penrith 20660. All letters will be answered and there is no need to enclose a s.a.e. for return letter. Unless we have a better response I suggest that the faithful few combine their news with the DX notes to VK4SS and assist him. 73, Don L2022.

☆

Publications Committee Reports

Publications Committee met on Monday, 10th April, and considered correspondence from VKs 2QL, 2QZ, 3IB, 3RN, 4SS, WIA-L4017 and WA0KKC. Technical articles were received from VKs 0CR, 3AJP, 3ZKC/T and 5WD.

The Committee also considered decisions of the Federal Convention as they affect the Committee.

Our Circulation Manager reported having completed a wrapper check against the new addressograph stencils and having made the necessary corrections with the mailing service. A very few mistakes were found, mainly deletions that had been missed by the mailing service.

Our financial position was considered in conjunction with the annual report submitted to the Federal Convention. Our financial position is satisfactory and it was agreed that the Chairman of the Committee would prepare a budget for the ensuing year and that he should seek assistance from the Victorian Division's Treasurer.

The 1967/68 edition of the Call Book is in course of preparation and it was decided to prepare suitable circular letters seeking advertising and orders for this publication. It is anticipated that we will adhere to the plan to have this publication available late August or early September.

There was some discussion on the matter of using reprints from overseas journals. Whilst the Committee was in agreement that these should be used, it was felt that so long as we have an adequate supply of original material supplied by Australian Amateurs we should use a minimum of reprints.

The proposal to publish a v.h.f. issue was considered. This matter has been held in abeyance for nearly six months waiting on material promised by the V.h.f. Group. Some has already been received and it was decided that this should be used as it is unreasonable to hold the type for this material any longer.

NEW CALL SIGNS

JANUARY 1967

VK1DL—D. L. Stevens, 91 Atherton St., Downer.

VK2SC—S. M. Waters, 22 McCallum Ave., East Ryde.

VK2ABL—W. A. Easterling, 279 Forest Rd., Kirrawee.

VK2BCM—A. C. McGrady, 45 Dover St., Summer Hill.

VK2BFO—B. E. Cloudesley, Flat 7, 431 Gt. Nth. Rd., Abbotsford.

VK2BKK—K. Khuen-Kryk, 16/17 Kings Cross Rd., Potts Point.

VK2BLD—D. B. Lyddieth, "Idahoe," Bells Rd., West Gosford.

VK2BND—Nepean District Amateur Radio Club, Station: Civil Defence Hdqrs., St. Marys; Postal: C/o. R. Lopez, 40 Desborough St., St. Marys.

VK2BST—S. J. Lloyd (Surgeon Cdr.), Station: 10 Sycamore Rd., Nowra; Postal: C/o. H.M.A.S.. Albatross, Nowra.

VK2BTR—T. Roberts, C/o. Commonwealth Hostels Ltd., Bunnerong Rd., Matraville.

VK2ZHQ—M. J. Caratti, 7 Evans St., Wollongong.

VK2ZHU—A. J. Hughes, C/o. Hornsby Hospital, Hornsby.

VK2ZIE—I. J. Parker, 17 Olive St., Asquith.

VK2ZJO—J. A. J. Waugh, 4 Astley St., Waratah.

VK2ZJV—J. R. Burnell-Jones, 16 Oxford St., Gladesville.

VK2ZLB—P. L. Boekenstein, 39 Wilburtree St., South Tamworth.

VK2ZSO—S. G. D. Martin, 6 Freeman Ave., Oatley.

VK2ZVG—M. J. Vellnagel, C/o. 42 Higgenbotham Rd., Gladesville.

VK2ZWN—E. W. A. Norquay, 39 Jackson Cres., Pennant Hills.

VK2ZWQ—W. M. C. Quinlan, 27 Stuart Ave., Normanhurst.

VK3BU—R. E. Goullet, 7 Drew St., East Keilor.

VK3UN—K. E. Pole, 5 Alvena Cres., Heathmont.

VK3ALI—G. J. H. Dunkley, Flat 2, 20 Victoria St., Box Hill.

VK3AVC—Caulfield Grammar School, 217 Glen Eira Rd., East St. Kilda.

VK3AVQ—H. S. Voake, 17 Haig Ave., Coburg.

VK3ZEJ—J. K. G. Rossiter, 23 Springvale Rd., Nunawading.

VK3ZVT/T—D. S. Thomas, 24 Albert St., Mt. Vaverley.

VK4CJ—C. W. Marley, 179 Newnham Rd., Mt. Gravatt.

VK4DJ—B. J. Davey, 140 Goodwin St., Currajong.

VK4ED—E. D. Eveslage, Apartment 2, 327 Hume St., Toowoomba.

VK4JU—J. M. Joughin, Station: Mayfield St., Buderim; Postal: P.O. Box 18, Maroochydore.

VK4NZ—N. Williamson, C/o. Peoples Palace, Sheridan St., Cairns.

VK4ZGB—G. L. Bell, 24 Colton Ave., Lutwyche.

VK4ZIM—L. J. Merrill, 269 Agnes St., Rockhampton.

VK4ZMV—M. J. Vincent, 105B Fernvale Rd., Tarragindi.

VK5FV—V. Clemence, 8 Robins St., Elizabeth Downs.

VK5MB—J. Mackison, 23 Shillabeer Rd., Elizabeth Park.

VK5ZIW—I. B. Werfel, Price.

VK5ZXL—K. D. Roper, 19 Stephens Ave., Torrensville.

VK6BT—R. L. Trepp, Lot 33, Waterfall Rd., Wattle Grove.

VK6HE—S. G. Upperton, C/o. Bank of N.S.W, Perth.

VK6ZEL—B. J. Arbon, P.O. Box 37, Borden.

VK7ZKJ—G. C. Johnston, 3 Inglis St., New Town.

VK7ZRO—R. W. Brown, 5 Woolton Place, Sandy Bay.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. Position in the list is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total D.X.C.C. credits given, including deleted countries. Where totals are the same, listings will be alphabetical by call sign.

Credits for new members and those whose totals have been amended are also shown.

PHONE

VK5MS	314/335	VK2JZ	266/281
VK3AHO	313/325	VK4HR	261/277
VK6RU	301/324	VK3TL	254/258
VK5AB	300/314	VK2AAK	233/237
VK6MK	298/315	VK4TY	229/230
VK4FJ	275/292	VK2APK	226/229

Amendment:
VK3HL 219/225

C.W.

VK3KB	319/342	VK2AGH	279/292
VK2QL	295/315	VK3NC	266/286
VK2ADE	291/313	VK3ARX	262/270
VK3CX	291/312	VK6RU	256/277
VK4FJ	287/309	VK3XB	249/262
VK3AHQ	281/293	VK3YL	246/263

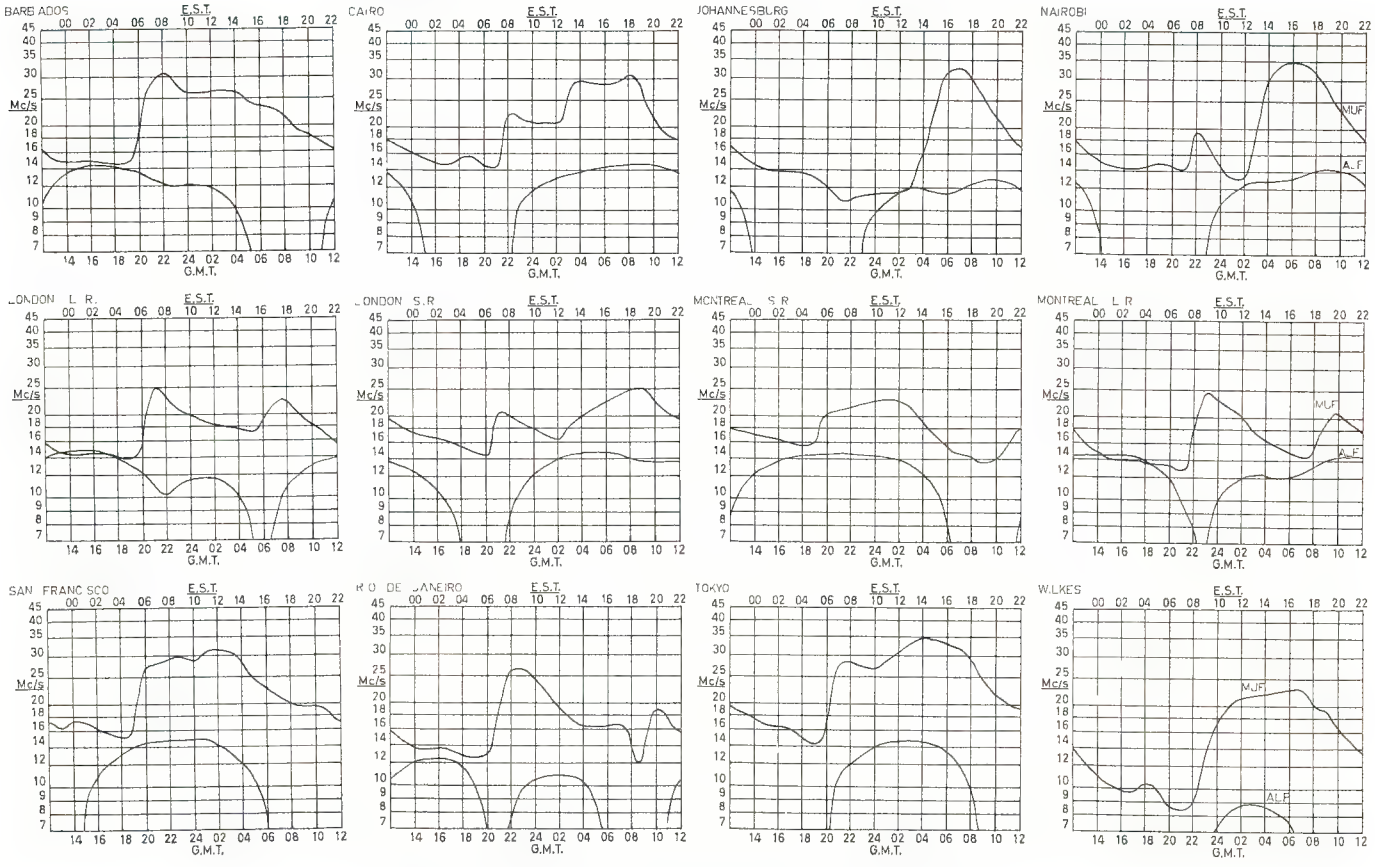
New Member:
VK4TY 124/133

OPEN

VK2AGH	308/326	VK2EO	285/306
VK2ADE	305/329	VK4HR	279/301
VK6RU	305/328	VK2ACX	276/300
VK6MK	300/317	VK4TY	276/286
VK2VN	297/312	VK3ARX	274/282
VK4FJ	293/315	VK3JA	272/290

Amendment:
VK3HL 245/253

PREDICTION CHARTS FOR MAY 1967



(Prediction Charts by courtesy of Ionospheric Prediction Service)

DX

Sub-Editor: ALAN SHAWSMITH, VK4SS
35 Whynot St., West End, Brisbane, Qld.

Talking point at the moment seems to be the wide open state of 21 and 28 Mc. At this QTH 15 mx has been workable from early morning till past midnight almost daily and 10 mx, although quieter, has been letting lots of signals through from all continents here. On either band it's only necessary to press the button or key to work DX. Both these bands have Europeans on them from 0700z and there also appears an odd African about this time. For the newcomer to DX, all this activity must be a new and pleasant experience. For the OT it revives the memories of the immediate post-war years when 10 mx was wide open and DXCC a piece of cake.

As stated before, I imagine the winter months will knock some of the life from these bands, but it is hoped that next spring and for a year or two more a great amount of DX will be worked on these frequencies.

So have a listen chaps and draw off the cream while it is there.

NOTES AND NEWS

St. Lucia: VP2LT on 14 s.s.b. now. QSL via VE3EUU. Duration of activity not known. (VK4VX)

Palmyra Is.: K0ZCN/KP6 is said to be on 14212 around 0900z. (LIDXA)

W6FAY, who is at present operating /MM, says he too will be active from Palmyra Is. anytime now for a good stint.

Cook Is.: ZK1AR has a good signal here, often around 14210 at 0500z.

Andamman Is.: Still going strong is VU2DIA. Now uses 14060 at 2300z or later.

Malagasy Rep.: 5R8BC on regularly 14220 at 0400z. Transceive. (LIDXA)

St. Helena: ZD7KH on 14235 2300z. QSL K2HVN. For the c.w. men, ZD7IP is a regular on both 7 and 14 Mc. Mainly near low end—1930-2030z.

Easter Is.: Dick K0OXV/CE0 now does most of his operating on 21 s.s.b., 1500-1700z. QSL K8EHU. (LIDXA)

Botswana: A report of activity by ZS8G and ZS8L on 14 s.s.b. 1700z, not other info.

K6KA and YF: These two prominent DXers are at present embarking on a world tour and intend to operate from these rare places as they go: 9M6, 9M2, 9M8, 9V1, HS, VU, 9N1, YA. UI8. EP2, OD5, YK1, SU1, 5Z4, 5X5, SV0 and others. Frequencies to be used are 7004, 14044, 21044, 7194, 14104, 21404 and 28544. QSL K6KA. (LIDXA)

Rio de Oro: EA9EJ uses a.m. and stays around 21200 kc., 1800z. Sometimes however he can be found 28490. (LIDXA)

Mariana Is.: KG6SL is on Saipan daily 28600 and 15 mx 2100z. QSL W4FRO, P.O. Box 714, Eau Gaillie, Florida.

Brunei: VS5MH is on mainly Wednesdays, 14190 1230z and listens 14205. QSL W1DGJ.

Aden: Remember Ray VS9ARV, a very active DX-peditioner on all bands who operated from various islands as VS9 PRV, KRV, HRV and elsewhere? Ray is now QRT and having a well earned rest back in U.K. Write to 15 Street Godersham, Canterbury, Kent, England.

Macquarie Is.: Rod VK0CR writes to say that the 52.9 Mc. beacon needs a few finishing touches before it goes into operation. Any report on its operation would be greatly appreciated. His QSL manager is Greg Johnston, Inglis St., Newtown, Hobart, Tasmania, or you can send your reports to Garfield North Rd., Garfield, Victoria Rod says he operates mainly on 14180 s.s.b. or thereabouts, mostly 1000z. However he also tries 80 and 15 if conditions are right.

Other activity from Antarctica is as follows: VK0CS at Mawson on s.s.b. VK0TO and VK-0GP at Wilkes. Most work between 14150 and 14180. 0700z or later.

Mauritania: 5T5KG QRV 14040 approx. Worked here at 2230z. This is Iris and Lloyd, ex-W6KG now DX-peditioning in Africa. QSL YASME.

Yemen: 4W1K/HB9AAT is said to be still active on 14120 s.s.b. at 1900z.

Falklands: VP8IE reported as active daily 14198, 0500z and 2000z. (ZL2AFZ)

Vatican: HV3SJ 14150 0530. QSL Box 9048, Vatican City. (ZL2AFZ). Also heard here on 14010 and 21 c.w. at 0600z.

Kermadecs: ZL1AI has been reported active on 7 Mc. Neil says this is a pirate as he does not use 40 mx. Cards for ZL1AI now go to K6UJW, 4825 Regalo Rd., Woodland Hills, Calif.

Hong Kong: VS6BJ, who was on the island for the past 17 years, is now ZL1TZ.

Uganda: 5X5AU, FS and JK are all on at the moment. Both 14 c.w./s.s.b. No calls beyond the 5X5J series have been issued. (G3UGT)

East. Carolines: KC6BW 14240, 0800z. QSL W7TDK.

Amsterdam Is.: FB8ZZ 14135, 1700z. Uses a.m. but will answer s.s.b. Also active is FB8YY now on 14020, 0700z.

Tchad Rep.: HK1QQ/TJ8 has been active as TT8QQ. He will go to TL8, TN8, TR8. He works 14 c.w./s.s.b. QSL to W4DQS. (G3UGT)

Fanning Is.: VR3C said to be on 14 s.s.b. at 0800z. (G3UGT)

New Hebredes: YJ8BW has now extended his operations to 21 Mc. c.w./a.m., 1130z.

Antarctica: Norm ZL5AC at Scotts Base workable here around 2200z on 14 c.w. Says they are settling in for the polar night. We may now hear more of his S9 signal; be patient, he will attend to the QSL situation when he returns in October.

Clipperton, Cocos, Malpelo and others: Starting early in May, Bill Rindone, WA6SBO, will set out expeditioning that will last over a period of a few years. 1A6SBO is one on his list. Modes, c.w./s.s.b. More info later. (LIDXA)

Uzbek: UI8KAA/K6KA and UI8KBA/K6KA; this activity is expected to occur late April and early May and run for a period of a couple of weeks—s.s.b./c.w.

Qatar: MP4QAL, 14125, 1830z. QSL to Box 56, Doha.

Cocos-Keeling: ZC2T said to be 14200 at 0230z. Says to QSL via K2AES. Is he ligitimate?

Madagascar: Chet 5R8AS, 28494 listening 10 up at 2000z. Also 14292 0500z. QSL W6ZPX. (LIDXA)

ACTIVITIES

Geoff VK3AMK supplies some f.b. info about the state of 15 and 10 mx. He also has worked some nice ones mainly around 28600 between 0700-1000z. They are 5A1TV, OH0NH, SM-4AIQ, OZ3WK, XW8CC, DJ6XI, F8CS, 9J2DT, ZE1JJ, G3RFE, YA1HD, I1PGL, GI3JIM, G2IC, G3MCG, ZL1APZ, ZL1JN, SM7ASA, UA3WD, VK8AU, HM9DL, UF6ACR, UH8AE, DL1CF, ZC4CN and a variety of others. On 15 mx: HS1CB, OH2OI, UH8AE, HL9KB, LA2TA, I1MCK, UC2AA, OZ4KY, VK9BS, LX1FH, PA-0HTR, GM5AFF, GW3VVJ, SL0CB, KV4CX and lots of other European prefixes mostly between 1200 and 1300z.

Alf VK3LC reports on openings on 14 Mc. The short path to North U.S.A. and Canada is improving as winter draws near in the Southern Hemisphere. Alf reports hearing many 3C calls around 0600z. DX worked were F8FY, G3VBK/MM, I1CWX, DJ1BJ, DL1EO, DL6EZA, HI8XAL, HK3LT, JA3KEM, ON5DF, SP9ANH, TG5HC, TI2OJV, XE1AAN, VE6TP, YS1HMN, ZC2JK, K0UTO/KL7, etc. Also KG6AQE, 9M-2EF, and G3MWG were worked using a stationary mobile whip antenna.

Merv VK4DV reports from North Queensland that 20 and 15 has been good but 10 has fallen off a little. He lists a variety of countries worked on these three bands which include all continents. Says East Coast W8s are very strong up there in early evenings on 20 mx.

Barry VK5BS has been doing some receiver modifications so has not been too active, but did manage these on QRP c.w.: KX6EQ, OA-4UA, OA4VE, SM0CCE, G2ATM, VU2DIA, HS1JM, UW9OA on 14 Mc.

(Barry is QRP officer for the Club in Oceania so please send him any relevant news you can. Like me, he needs all he can get.)

Bruce VK3BM, from Quambatook, writes a very informative letter on the state of 10 mx generally, part of which I include here. He says, "I have been operating on 10 (around 28575 approx.) since early November and in all that time only on three occasions have I not been able to QSO U.S.A. and the surrounds. I am on daily, week-ends excepted. The band is usually wide open between 2200z and 0000z. I seldom get on between 0900 and 1100z, but when I do Europeans are usually QSO'd. I have now contacted G3FPQ on five bands." (This makes you eligible for FBTOC Award, Bruce OM.)

Bruce also says that he is working Europeans on 40 mx also. He also reports a phenomena on 10 mx which I think is experienced by many from time to time. On odd occasions when working DX on the short path it is found that a better signal results when the beam is pointed in a direction other than the direct route. (Had this experience with a KH6 recently. His signal was best when pointed to JA and mine to the north. Thanks OM, some more information whenever you can.)

Dud VK4MY has been QRV on 14 and 21 Mc. and sends in some nice ones this month. 14 s.s.b.: VP2VV 0610 14108, 5A1TV 0700, 5W1AA 0720 14150, YA1FB 1315 14182, ZL1AI 1737 14024, ZB2AK 0705 14118, FO8BS 0932 14115, CT1SQ 2045 14106, IT1AUA 2058 14106, KP4AST 2119 14228, 9M8RS 1034 14150, VK0CR 0605 14158, ZP3AL 1017 14122, ZC4AK 1400 14128, SV1DL 1412 14128, 5N2AAX 0648 14187, 3C1ARM and 3C1ARB 0600 14119. Worked on 14 c.w.: FU8AG 1016 14020, KV4AM 14012, UF6BD 0700 14059, UQ2AN 0615 14022, UY5LF 1325 14068, 6Y5JB 0747 14036, FL8DY 1938 14080, CT1DJ 0736 14080, SL6BU 1620 14024, 9M2LO 1022, VE1TG 1106 14007, ZB2AM 0729 14004. Dud lists these that got away: GC8HT, DU-0DM, UD6CE, CT1BT, TA2AC, ZE7JK, ZP5JB, UN1BK, HM1DM, SV0WFF.

Peter VK4PJ reports 10 mx as hot with 15 not far behind. He is not too active but lists these good ones on s.s.b. 10 mx: SM2CTY, KR6TAB, SM7XA, DL8OT, SV1BL, LA5YE, SM7CBZ, ZE1JJ, KR6LS, DL9SQ, ZS2AF, ZL-2JK, ZS5FF, ZS5AD, 9J2VX, VK8OX, UF-6ACR, UC2AA, GW3MFY, DL9FG and many Js and Ws, etc. On 15: OZ3KB, SM5HK, HB-9KX, DL1DC, G3CAZ, ET3USA, GD3RFK, GM3POK. Peter says that on his QSO with GM3POK he received him best with his beam pointing some degrees off normal. On 14 Mc.: 9G1JM, VE3IG, VE1AGH, 5R8AZ, 7Q7LZ, LU-9DAH, KC6JC, HK3AXW, HK3AVI, ZS4SD, TF2WKE, OZ3KB.

Reg VK4VX has been able to work 10 from early morning till near midnight. He lists some 40 countries worked in the past couple of weeks. They are 28 Mc. s.s.b.: HR1JMF, HR-1SO, YV5AXT, DU1FH, 9M2LO, W7VPL/KL7, PJ2CR, HB0LL, MP4TBO, XE1YO, OA4EM, KZ5IK, HP1JC, UF6AKR, VE7ZD, UR2EK, ZP5OP, EI6AS, VS6FR, OH1VR, DL9PU, UC-2BO, F5DL, DL2TM, UH8EG, SM5CO, UA3TU, SM0AA, UC2BO, F9BO, ZE1JJ, DJ4GR, G3JOC, KH6BI, KR6LS, ZE6JN, KB6CZ, ZS1FH, ZS-3HT, ZS4OI, ZS5V, ZS5FF, ZS2AF, ZS6CN, ZS1NN, ZS5QU and lots of the more common European prefixes. Also all G, ZL, VK and W districts.

Bert VK5BB advises on the following: Bert KV4CX on St. Thomas, Virgin Is., is on 21340 most nights around 1030z. He is seeking VK QSOs and QSLs 100 per cent 9G1DY and 9G1KT are working VK on the l.p. on 21320 around 0400-0600z. The latter is the Ghanaian QSL Manager. YV1CT also on 21320. Name Josie/YL. She is an avid stamp collector. Listen for her around 0630z. Bruce KP4BCL daily looks on the s.p. for VKs on 21 s.s.b. On quite often. Gives QTH as San Wan. Tony VQ9AR has returned to the States. Sends his 73 to all the VKs and reports that other activity can be expected from the Seychelles.

Chas VK4UC still getting among the 20 mx DX with his QRP and Bruce array. On 20 c.w. he landed CE1FF 0745, HA1SB 0630, F3ZU 0830, KV4AM 0740, XE2SS 0800z, OA6W 0950, JH1AFW 1340, KM6BI 1400, 6Y5JB 0815, SL7CA 0730, UO5KBR 1350, ZS4JU 1400, ZE8JJ 1420, KP4CRT 1215, DK1HP 0800, TU2BK 0812, VE-BMK 0810, LA8CJ 1320, EA1BC 0750, TA2AC 2100, VP7DX 0500, 5N2AAF 0610, ZD7IP 0750, ZS5UW 1410, YS1O 1330, CR7IZ 1430, CN8FC 0820, UP0L15 North Pole, ZS5EY 1430, plus lots of 3C's during A.R.R.L. Contest. On 14 a.m.: ZP5CF 0600, VE1PL 2130, LU9DAH 0900, HS4AK 1054, KG6IF 1100, 9M6JP 1000, HM1BB 0945, EA4CR 0930z. Chas reports that VK8OX is QRV in North. QSL to G5UG. The QSL for KV4AM goes to Box 717, Christiansted, Virgin Is. KG6SN says QSL to Box 341, Saipan, Marianas 96950.

All times are G.M.T.

George VK3ZCQ writes and asks would I give JA9AFS a mention in the column. Masa is looking for c.w. VK QSOs on 14 Mc. (should be easy). He QSLs direct 100 per cent. His QTH is 2 Nachimachi Kaigandori, Toyama-City, Toyama, Japan. He has already worked VKs 2IC, 5ZE and 3APO.

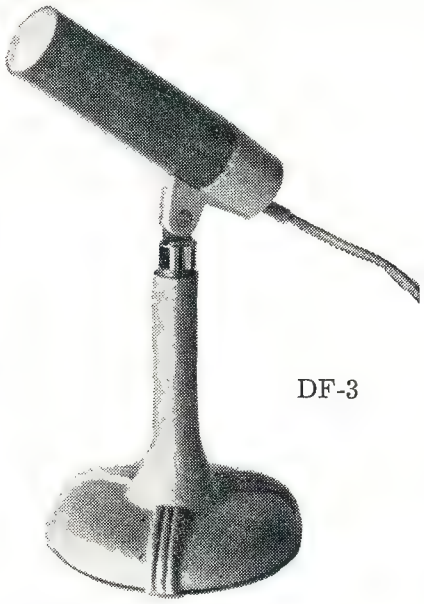
AWARDS

Alf VK3LC sends the following award for those avid collectors of wallpaper. The virtue of this one is that it is FREE. It is issued by the LCRA DX Club—A.P. 584, Bogota, Colombia, S.A. It is the "73" Certificate.

Work ten members of the club, after 1/1/66 (7 in HK3 Zone and 3 in other zones, or work 10 members in HK3 Zone). Any modes. Send QSLs to the members QSO'd and log data of QSOs with dates to the above address. No I.R.C's required. Some members at 1/8/66 are HK3ABH, 3APC, 3API, 3AJV, 3ASJ, 3AUE, 3AVK, 3BAE, 3HY, 3KN, 3LT, 3RO, 3UA, 4AJC, 5ACI, 5AOH, 5SL, 4BQ.

It might be a good idea, space permitting, to feature an award each month. There are some 2000 odd on the market. Some very f.b. More info later.

FOSTER DYNAMIC MICROPHONES



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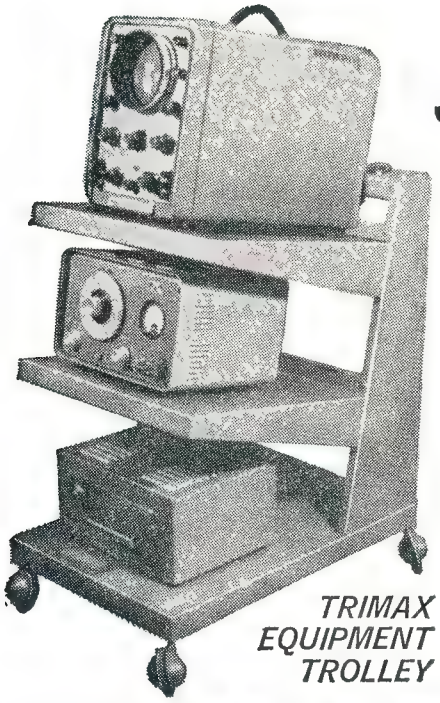

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L37/A

VHF

Sub-Editor: CYRIL MAUDE, VK3ZCK
2 Clarendon St., Avondale Heights, W.2, Vic.

VK0CR BEACON

Amateurs hearing the Macquarie Island automatic beacon VK0CR are requested to log the following information:

Time, strength, readability, beam headings (there could be more than one direction in which the signal peaks. If so, note each bearing and each signal strength).

The beacon is an automatically keyed c.w. beacon with the call sign being repeated twice a minute, the keyer takes approximately eighteen seconds to send VK0CR followed by a short key up, a short key down, a short key up, the whole sequence taking thirty seconds.

NEWS FROM J.A.R.L.

From 1st April, 1967, the A2 emission from JA1IGY has been altered from the 50.5 Mc. frequency to 51.990 Mc. This has been done specifically to allow VK stations observe band openings to Japan. J.A.R.L. are aware of, and have publicised in their country, the Australian allocation of 52-54 Mc.

JA4IGY, JA6IGY, JA8IGY and JA9IGY continue to operate A2 on 50.5 Mc., and all beacon stations are on the air 24 hours a day.

NEW SOUTH WALES

Hunter River Branch.—52-54 Mc.: This band has been very quiet with only three openings since the Ross Hull Contest closed, and these openings were small at that. The local net which is held on Saturday and Sunday mornings has also been very quiet with only a couple of active stations at the most. The weather has not been the best—only wet and cold, typical N.S.W. weather.

144-148 Mc.: Some fair openings have been had to Sydney during the month. Barry 2ZUB is now 2BUB and is making good use of his Swan. Kevin 2ZKW managed to get the Y.M.C.A. Radio Club going with some twenty odd members at the official opening. Local Amateurs seen at the opening included VKs 2AKX, 2ZSG and yours truly 2ZMO. Gordon 2ZSG is building a skeleton slot, so that he can make a loud noise in Sydney town. 73, Mac 2ZMO.

VICTORIA

Activity over the past month has been very poor on both 6 and 2 mx. A couple of DX openings were reported, these being to northern VK7 and eastern VK5.

The March meeting of the V.h.f. Group was the annual general meeting and election of office-bearers. After nominations were received for members willing (?) to be office-bearers, it was found that there were more names than vacancies and it was decided that it would be the right thing to have an election. We did, and we found that the following persons were given some work to do between the dinner dishes and bedtime:—

Chairman and president, Peter 3ZPA; vice-chairman, Jack 3ZJF; Council rep., Jack 3ZJF; past president, Cyril 3AEE; secretary, Neville 3ZPN; treasurer, Trevor 3ZTJ; publicity officer, Cyril 3ZCK; QSL manager, Bill 3ABP; equipment officer, Peter 3ZAV; assist. equipment officer, Robert 3ZPX.

The treasurer of the Group stated that the Group's finances are in a very healthy state, even though large quantities of coffee and biscuits are consumed after each meeting.

Other activities of the Group include 2 mx fox hunts held on the fourth Wednesday of each month, 2 mx scrambles held on the second Sunday, and the V.h.f. Group meeting which is held on the third Wednesday. During the summer season the Group holds field days and conventions. 73, Cyril 3ZCK.

Eastern Zone.—52-54 Mc.: Ch. 0 t.v.i. spoilt many a fine QSO in Gippsland over the Christmas period, even though vertical polarisation and working above 53 Mc. Most of the t.v. antennae to the west of me are of the older type and are rather inefficient on Ch. 0. Late December 5ZBR and 5ZDR were received throughout the La Trobe Valley on t.v. sets tuned to Ch. 0, so I came on six to warn them of the t.v.i. that they were causing, also the QRM from Adelaide t.v. Ch. 2. The P.M.G. promptly rang me and told me to keep off six whilst Ch. 0 Melbourne was on the air with any sort of transmission at all. So it looks like the midnight to dawn shift for me with six metres.

On the DX front there has been plenty but for reasons just stated all I could do was listen in envy. I have noticed that when there is a heat wave with the possibility of thunder storms, six opens. Is there any connection between the two?

Over the past few months the m.u.f. has been increasing, the highest so far for this sunspot cycle with the 26 Mc. broadcast band opening each evening and reaching a climax on 12/3/67 when European t.v. caused severe interference to Rhodesian t.v. reception. This piece of info was reported to me by Reg 3AWV who obtained it from Charlie ZE1JJ, of Bulallayo, via 28 Mc. The same day several African and Middle East stations including Zambia and OD5EY of Lebonan were worked by VK3AWV who was using a simple G5RV. Reg has also been working VK0GP at Wilkes and VK0CR at Macquarie Island.

144-148 Mc.: This band has been open to all parts of VK3 over the past couple of months and activity has been at a very high level. 73, George 3ZCG.

TOWNSVILLE AND DISTRICT

The main news from the tropical north (apart from severe floods) is the continuing daily northern DX from Japan. Since early Feb. until the end of March, two openings per day have been heard in Townsville. Openings occur between 1330-1600 and 1800-2300 hours E.A.S.T. The Townsville gang of 4ZGJ, 4RO, 4ZPL and 4ZRG have had a great many QSOs in working all call areas on 52-53 Mc. Band conditions have been good with 5 and 9 signals both ways, but QRM high. As well as JA signals, other calls to date have been JH, KA and KR6.

To date we believe that 8KK, 8ZMR, 6WG, 6ZCN, 4ZAZ and some Brisbane stations have also worked the JAs. A feature of the conditions is the reception of Russian television as well as many Asian f.m. and a.m. stations as high as 60 Mc.

Closer to home we find Peter 4ZPL balancing a 6 element long Yagi above his roof, and working his first JA. Graham 4ZGJ back and forth to Rockhampton, while Phil 4ZEE now has his 6 mx tx on the air. 73, Bob 4ZRG.

WESTERN AUSTRALIA

On Sunday, 12/3/67 I heard Bob 6BE mention on the news that the JAs were through that afternoon. I erected a ground plane and hooked up a converter and heard JAs 1, 2, 3, 6, as well as JA1IGY, JA6IGY and JA9IGY. They were all transmitting m.c.w. on approx. 50.5 with VVVDE preceding the call sign. On the ground plane, signals were 5.5 to 5.9, the band being open from 1600 to 2130. I also heard some very wide band f.m. on 49.1 and 49.3 and video on 49.75 all at very good strength.

On Monday evening the story was the same and I even heard a JA1 calling CQ on 52.2. I decided to get the tx going and was on the air at about 1700. A call immediately brought results with JAs transmitting on about 52.2, and I worked 10, including JAs 0, 1, 2, 7 in an hour with signals up to S9 plus. 73, Andy 6ZCN. (Reprinted from the W.A. V.h.f. News Bulletin.)

☆

YRS

From all indications the Y.R.S. is growing steadily and I am very glad to be able to report the formation of another club at Maitland, N.S.W. This is in the Y.M.C.A. and the club is very fortunate to start off with a lecture room 41 x 12 ft. complete with theatre seats, blackboard and a motion picture screen with an addition to come of a projection room. The club has also taken over an adjoining room 24 x 38 ft. which is being made into a workshop, store room and tx department. What a "shack"! The class meets every Friday night at 7.30 p.m. but very shortly the time will be extended to include Saturday afternoon for practical demonstration, etc. The club starts with a membership of 25 including 7 adults. There will even be a s.w.l. group started later on.

A good deal of local interest was shown in getting the club going with Dr. Colvin performing the official opening supported by Ald. Unicomb, Deputy Chairman of the Shortland County Council. Among the official guests were Mr. G. Sutherland, VK2ZSG, Sec. of the Hunter Branch of the W.I.A., and Mr. G. Ward, Sec. of the Maitland Aero Modellers, as well as Mr. Keith Howard, VK2AKX, Pres. of the West Lakes Radio Club, who gave a very interesting talk on the operation and meaning of the Y.R.S. After the opening ceremony there was a short programme of sub-technician films and supper.

The club leader is Mr. Kevin Watson, VK-2ZKW, and Treasurer, Mr. Ian Goodman. Anyone wishing further information should write to Maitland Y.M.C.A. Radio Club, 264 High St., Maitland, N.S.W. 2320, or Phone Kevin at 33-7286.

Congratulations to Kevin and his helpers for the good spade work with regard to your new radio club and we wish you many successes and hours of good fun.

As the boys work steadily through the different certificates they naturally have an interest in radio telephony and wireless telegraphy. There are certificates for these sections but they are not compulsory and are available to satisfy the keen interest of the Youth Radio Scheme'ers. The purpose of the certificate is to provide an operating efficiency based on the requirements of the P.M.G. Handbook and to teach the highest standards of Amateur Radio operating practices. Anyone interested in the syllabus for the radio telephony and wireless telegraphy certificates should write Mr. M. Hooper, 182 Melville St., Hobart (large s.a.s.e. please) plus two 4c stamps for each copy required. Local tests for Morse sending and receiving for the W/T award will be held at the Scout Hall in Bestic St., Kyeemagh, on Tuesday evening by special arrangement with Mr. J. F. Scougall, VK2BXK, C/o. Kyeemagh Y.R.S. Club, 23 Caroma Ave., Kyeemagh. Mr. Scougall will also arrange for inspection and assessment of the radio logbooks submitted by candidates, and for a trainee to work with a nominated licensed Amateur. Mr. Scougall is also the source of "Multiflash" project cards and club leaders, State supervisors and postal group leaders need only contact him for same but be sure to include two 4c stamps for each card ordered.

Here is another address for the Y.R.S. lapel badges. Those who have gained the elementary are entitled to this and to get a badge you should send a postal order for 50 cents plus s.a.s.e. to the Secretary, Y.R.C.S., Mr. M. Plummer, 71 Kernan St., Strathmore, Vic. This is a very attractive badge and will look very smart on your lapel.

CLUB NEWS

Australian Capital Territory, VK1: Roger Davis' bulletin is full of interesting details as usual with some very good articles. As a matter of interest, Roger also produces the newsletter for supervisors and leaders. For P.G. members, Roger has a supply of component parts at very reasonable prices.

New South Wales, VK2: Camp Technology held in the Blue Mountains last summer had several successes for the Junior Certificate—Paul Zucker, Bruce Evans, Graeme Bryan, Neil Reynolds, Philip Drummond and Martin Farleigh, B. K. Boardman, D. R. Ashton and Philip Wait all of Sydney Grammar also gained the Junior as did Peter Dalgleish of the 1st Kyeemagh Sea Scouts and David Truskett of Kiama High.

N.B.: I am in the market for as much news as possible and it would be appreciated if club leaders in all parts of Australia could have news of their activities, certificate successes, field days, etc., sent to me by the last Wednesday of each month. Only the barest details are required but I must have the information to make the column interesting. The address for news is Mrs. M. Swinton, VK2AXS, P.O. Box 1, Kulnura, N.S.W. 73, Mona VK2AXS.

☆

SOME QTHs

VP2VV—Via KV4CX.
5A1TV—QSL via W7WQR.
5W1AA—P.O. Box 498, Apia, W. Samoa.
YA1FB—U.S.A.I.D., G.P.O., N.Y. 09668.
ZL1AI—QSL via K6JUW.
ZB2AK—C/o Sub Cable Co., Gibraltar.
FO8BS—P.O. Box 374, Papeete.
9M8RS—Telecomm. Hdq., Kuching, Sarawak.
ZP3AL—P.O. Box 512, Asuncion, Paraguay.
5N2AAX—P.O. Box 3380, Lagos, Nigeria.
FL8DY—QSL to R.E.F. only.
CP1CZ—P.O. Box 2964, La Paz, Bolivia.

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

CLUBS FOR HANDICAPPED PEOPLE

Editor "A.R.," Dear Sir,

I am writing to enquire whether any of your readers who, being physically handicapped and have an abiding interest in radio, would be interested in forming a National Radio Club or Union especially devoted to their interests.

I know many handicapped persons who are interested in radio and cannot fully participate in it because their disabilities prevent them from doing, say, intricate wiring or even general construction work, e.g. paraplegics, spastics, etc. Therefore if a National Radio Club or Union were to be formed, it would require some assistance of Hams and S.w.l's to help these disabled persons to construct their own gear.

If, on the other hand, there are clubs already in existence, would they be interested in a National Union of Radio Clubs for Handicapped People?

Those interested in this matter may contact me at the following address: 5 Helen Street, Newstead, Launceston, Tasmania.

—Robin L. Harwood, S.W.L. 7022.

PREDICTIONS

Editor "A.R.," Dear Sir,

I cannot let the letter of VK3AKZ pass without replying to one section. In this he quotes: "the maximum would be the highest on record." I wonder what was the date of the article he read.

In my article in January issue I also mentioned (col. 1) this prediction had been made but that particular reference was **before** the new cycle commenced.

If Mr. Head refers to September issue of "A.R.," he will find a table listing sunspot numbers since 1954 and a simple interpolation will show how the present cycle is progressing. To enable him to bring himself up to date, I have received from the "experts" in Zurich, through the I.P.S., Sydney, the additional **smoothed** monthly figures for 1966:

Jan. 27, Feb. 30.6, Mar. 33.6, Apr. 36.4, May 39.5, June 43.3, July 48.8, Aug. 56.4.

These figures are actual and not predictions.

These figures are available to the magazine from I.P.S. and I have recently suggested they be obtained and printed each month as I do in the VK2 Monthly Bulletin.

—F. T. Hine, VK2QL.

THAT S.P. ARRAY

Editor "A.R.," Dear Sir,

Reference to a letter by Wal. E. Salmon, VK2SA, "A.R.," Feb. '67, in which he states that he would not subscribe in any way to statements made by me in a letter, "A.R.," Jan. '67, dealing with the Series Phased Array. Well, bully for him. It's his right if he so pleases, in this great democratic country of ours to disagree, and say so, with whom ever he wants to, be it the P.M. or for that matter H.R.H. herself.

I have, as suggested by VK2SA, re-read my letter, especially that part he refers to, which I take to be (there was a word or words missing from the text of his letter) where I stated, and I quote, "The only point to remember is that the array radiates towards the feed point, not away from it." To VK2SA I suppose this sounds like a one way ticket to nowhere. But nevertheless it is a fact. After all, I was talking about an array, so naturally this is with reference to the array length. It means quite simply that the direction of maximum radiation is along the length of the array toward the feed point, not from the feed point along the length of the array.

Regarding performance, VK2SA is upset because, to use his words, I did not in one instance give any practical results on the operation of my array.

I did say in my original article, "Series Phased Array, Mark ?" "A.R.," Feb. '59, that I had a 4 element array operating on channel 2 and quite good results were being obtained. My series phased arrays have long since bitten the dust and their remains are on the scrap heap. They were, as I stated in "A.R.," Feb. '59, designed for use at this location to receive the Melbourne t.v. stations, prior to the advent of country t.v.

No actual measurements of gain were made, but from comparative tests against dipoles, I think it would be safe to say, their gain was about on a par, with what could be expected from an end fire array, with the same quarter wave spacing and 90 degrees phase difference between the elements. Which for a 4 element (¾ wavelength long) array is about 5 to 6 db. I also mentioned in my letter, "A.R.," Jan. '67, gain figures to be expected from end fire arrays with the above spacings, etc.

Unfortunately for Wal Salmon there is one point on which we agree and this is that these arrays are strictly one-band affairs.

If VK2SA or any other person for that matter still does not want to subscribe to my statements, but are still interested enough to find out for themselves, I suggest they refer to the following:

1. "Short Wave Wireless Communication," Ladners and Stoner. John Wiley & Sons, 2nd Edition, 1934.
2. "Admiralty Handbook of Wireless Telegraphy," 1938, Volume 2, Section R, Paragraph 47.
3. "QST," Dec. 1945, p. 62. "The World Above 50 Mc." E. P. Tilton.
4. "Amateur Radio," May 1948, p. 3, "Series Phased Arrays," by H. K. Love, VK3KU.
5. "Amateur Radio," January 1950, p. 14, "The Lenfo Series Phased Array," by Len Jackson and Col Gibson, VK3FO.

My letter to "A.R.," Jan. '67, was intended to clear up some misunderstanding by VK2SA with regard to statements made in my Feb. '59 "A.R." article, and at the same time to point out that he had incorrectly referred to his antenna, "A.R.," October '66, as a "Series Phased Array." Here some might say "What's in a name?" Quite a lot really, as the name sometimes goes a long way towards describing what is under discussion. Those of us who are or have been actively engaged in the art, should make every effort to use the correct terms when describing something, and thereby prevent a lot of confusion.

—Colin A. Mackenzie, VK3ACM.

[This correspondence is now closed.—Ed.]

VK2 DIVISION

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The R.E.S. is operated by the VK2 Division and its facilities are available to any member of the W.I.A. in any State.

TAPED LECTURES

No. 30—T.V. Station Antenna Design, Part 2; gain, patterns, power dividing and cabling. 67 mins., 19 slides. John Vanderley.

No. 31—Communication Receiver Design. 60 mins., 21 slides. Keith Woodward, VK2ZAU.

No. 32—As it was in the Beginning. 90 mins., 26 slides. Joe Reed, VK2JR.

No. 33—Prince Phillip's Dunrossil Lecture (1965).

Details from the Education Officer, Wireless Institute Centre, 14 Atchison St., Crows Nest, N.S.W.

CRYSTALS

Some of the frequencies listed between 3540 and 6450 Kc. are now out of stock. Details of those no longer available will be given in the near future.

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FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL AWARDS

RECIPROCAL AWARD JUDGING WITH THE CENTRAL RADIO CLUB OF THE U.S.S.R.

Commencing forthwith, detailed check lists appertaining to the awards offered by the Central Radio Club of U.S.S.R. may be submitted by W.I.A. members direct to the Federal Awards Manager (VK3KB) for certification. Sufficient postage should be included to cover cost of returning the QSLs, registration being added if so desired. Central Radio Club advises that applications will be dealt with free of charge.

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NEW SOUTH WALES

Owing to Good Friday falling on the fourth Friday of March, the annual general meeting and March monthly meeting were both held on Friday evening, March 31. The retiring President (Tom O'Donnell, VK2OD) occupied the chair and there was an attendance of between 40 and 50. Ken VK4OF was the only visitor.

The main interest centred around the ballot for the election of Divisional Council, as there were eight nominations for the seven positions. Ivan Agar (VK2AIM) was appointed Returning Officer and P. Doman (VK2ZPD), J. Young (VK2OY), W. Treloar (VK2BPZ), P. Carter (VK2ZPC), R. Milton (VK2ZMM) and S. Kuhl (VK2ZSK) acted as scrutineers. With the Division's honorary legal officer, Bill Clark, this team retired from the meeting to examine the voting papers.

There were two features about the ballot that did not reflect at all favourably on the members generally. Firstly, the ballot papers received totalled only 336, indicating that many of our members apparently do not care two hoots what happens in the Division, at least when it comes to voting for candidates who will be looking after our affairs for the next twelve months. Secondly, the high percentage of informal votes—86 in number—was ridiculous. Most of these resulted from adding signatures and call signs on envelopes containing ballot papers or omitting these details altogether from the outside envelopes. In future ballots we suggest that all members take more notice of the instructions that go with the ballot papers.

Those successful in the ballot were as follows: P. W. Campbell (VK2AXJ), S. Dogger (VK2ZRD), K. L Finney (VK2KJ), C. Henderson (VK2CH), D. Jeanes (VK2BSJ), W. J. Lewis (VK2YB), C. J. Wilkins (VK2ALB).

At a short meeting of the new Council later in the evening, Ken Finney (VK2KJ) was elected to the position of Divisional President, with Bill Lewis (VK2YB) Senior Vice-President and Charlie Wilkins (VK2ALB) Junior Vice-President.

The annual report presented by the retiring chairman was taken as read, and several complimentary references were made to Tom's work during his term of office, the general tenor of the remarks being that a year's good work had been brought to a close with an excellent report.

It was a matter of some regret that one of the retiring councillors, Hebe Grouse (VK2AOK), did not nominate again this year. As the Division's first lady councillor, Hebe had acquitted herself very well and, according to many reports, was the most popular VK2WI broadcaster among those who carried out this job.

Copies of the report and balance sheet submitted by the auditor (Mr Rowan) were available at the meeting. The favourable financial balance indicated that the retiring Council had kept a tight rein on expenditure during the year.

The March monthly meeting opened with an interim report by the Federal Councillor (Pierce Healy, VK2APQ) on the Federal Convention held in Hobart over Easter. This report (which will be published in our monthly Bulletin) was a favourable one in many ways, especially in the matter of the proposed Federal Constitution, as it would appear that we could be within sight of agreement in the few remaining problems. Pierce was accorded a vote of thanks for his report.

The President reported that Mrs. Betty Gerdes, who had carried out the combined duties of Secretary and Treasurer for some time, had found it necessary to tender her resignation because of increased domestic duties.

A vote of thanks to Mrs. Gerdes for her efforts on behalf of the Division was carried by acclamation.

A good deal of discussion ensued over the appointment of a successor to Mrs. Gerdes, following a motion by Alan VK2ZAX that a paid Secretary-Treasurer be appointed. Several speakers spoke against the motion. It was agreed that such an appointment would be highly desirable if it could be financed, but to do so would inevitably result in a steep rise in subscriptions. In any case, it was felt that a better resolution would be one that requested Divisional Council to investigate the possibility of appointing a paid Secretary-Treasurer, and eventually an amendment along these lines was carried unanimously.

The following new members were admitted to the Institute at the March meeting: Lloyd Davies (VK4ZLO), Kenneth Duncanson (VK2ZDU), David Coutts (VK2ZDX), Arthur Heckenberg (VK2AHL), Graeme Hough (Assoc.), Alan Nutley (Assoc.), Ian Parker (VK2ZIE), Lawrence Peasley (A.O.C.P.).

Items of business in brief at the meeting were: A request by Alf VK2ZIW for three more volunteers for the V.h.f. Morse practice roster; thanks to Mrs. Peell, widow of the late John Peell, for a donation of two textbooks to the Divisional Library; and a report by Keith VK2AKX that David Fraser, a schoolboy member of the Youth Radio Scheme, had passed his A.O.L.C.P.

We regret that we have to record the passing of yet another member, word of which was received only at the end of March. John Bonnington (VK2AKB) passed away suddenly on 18th February. John had not been very active for the past 12 months on account of frequent illness, but often listened on the bands. He was a former airline pilot and businessman, and when active on the air was keen on 28 Mc. working. Our retiring Divisional President (Tom O'Donnell) reports that during the Geophysical Year observations, John provided him with 28 Mc. propagation details. To Mrs. Bonnington we extend the sympathy of all members of the N.S.W. Division.

URUNGA CONVENTION

From Bill VK2OE we have details of this popular Convention which from all accounts was very successful. Among the 29 Amateurs and 11 XYLs who registered, there were quite a few who made the trip from Sydney, in spite of the distance, and a glance at the prize list will show that they made their presence felt, too.

The programme went off smoothly and the weather was good. While the OMs were tearing around the countryside looking for those elusive hidden transmitters, the XYLs were well catered for with afternoon tea at Coffs Harbour on the Saturday and a scenic drive to Dorrigo on Easter Sunday.

At the prize-giving, Noel VK2AHH supplied the music on a Hammond organ and Jack Grear, of Bellingen, gave a bracket of songs. Both were well received and the committee extends appreciation for their efforts. Pity we cannot get Noel and Jack down to Sydney for our annual Convention; they would be a welcome acquisition on the entertainment side.

Next year will be the 20th anniversary of the Urunga Convention and the organisers are making plans already to make it an occasion to remember. They urge all those who think there is any chance of attending to start making their plans right now for Easter 1968.

Results of the field events: Saturday—7 Mc. Hunt: Bob VK2ASZ, 1; Allan VK2ASI, 2; Bill VK2ZCV, 3. 144 Mc. Hunt for $40 prize: Paul VK2ZPV, 1. Sunday—144 Mc. Hunt: Bob VK2ASZ, 1; Paul VK2ZPV, 2; Tony VK2ZCT, 3. Urunga Scramble (all-band): Bill VK2XT, 46 contacts; Bob VK2ASZ, 38; Harry VK2LX, 25. 73, Ivan, VK2AIM.

HUNTER BRANCH

The advent of the transceiver has made the working of DX on the h.f. bands a commonplace event and s.s.b. seems to be the order of the day. Imagine the surprise then of one of our well known operators who erected a dipole on 15 metres and then fired up the old faithful a.m. rig into the feeder. Expecting very little he had a reply from a W7 who gave him 5 and 8. So overjoyed was he that he decided to call another station and wind the wick up a bit further. The meters went hard over, as I am told, and all the gear went up in a cloud of prettily coloured smoke. Such is the price of success.

Seriously though, there are plenty of opportunities to work some quite good DX on 15 and 10 metres just now and some of the local boys are getting amongst them. At times the band is wide open for a few minutes and then dead again as 15 can be. This applies also to 52 megs. where DX should improve as we get towards the sunspot maximum. So, whether you operate your single 807 on a biscuit tin chassis or wrap your new transceiver in a plastic bag, get with it and use some more of the bands. After all, two of the hf. regulars, Col VK2YJ and Les VK2RJ have given at least 10 days to the others by being absent cruising around the Pacific. What a shame they could not take the gear with them—or perhaps that was the idea, to give the other boys a chance.

The activity on v.h.f. used to be the thing a year or so back and this may still be so but this rash of r.f. certainly does not apply to the 146 f.m. channels where one may call oneself hoarse any day of the week and get no replies whatever. How about you fellows with carphones using them, say once a week. It would be a real change to hear a signal.

Sherwood, our old friend from the coaly city, is on the air at last. The only qualification needed for this statement is that the air is that which holds up his aircraft and the r.f. type air is as far away as ever. I doubt if VK2AJF will ever be heard. His aeronaut companion, Bones VK2ZQB is also more on the air type air than the other sort and so pleased is his instructor that he says he's a perfect pupil. What the gentleman fails to realise is that Bones had plenty of practice at low flying before he ever took to an aircraft and this puts him several streets ahead of his nearest rival.

On the more youthful side still, we have another young member who soon expects to be on the air with a Z call. He is David Fraser, who lives in Kotara. David, who is 16, is a student at Tech. High and he passed the January examination, his first attempt. Already he is preparing to convert his "Z" licence to a full call and his Morse speed is almost there. He has made use of the facilities at Westlakes Radio Club, where the Morse trainer is now fully operative.

Cool autumn nights are conducive to many forms of activity and as far as Amateur Radio is concerned this is so, for I heard Chris VK2PZ in a QSO on 80 metres just recently. He was telling a VK4 friend of his 4-gallon honey tin. The honey, you must know, is used to sweeten tea consumed in large quantities at the PZ ranch. You'd never believe it, but the VK4 thought Chris was pulling his leg. The heavenly beverage gives Chris the strength to keep the boys hard at it at VK2AXC, the Cessnock Radio Club, where there are now three Z calls busy on the brass. Latest addition is Kent Scott, or "Scotty" to you blokes who know him by his abbreviated handle.

New calls must soon be the order of the day where the black diamonds used to be. Kevin VK2ZKW is making a very definite impact on the populace of Maitland with the new Y.M.C.A. Radio Club there. He has students from school age to several times that figure and all who attend are profiting by Kevin's expert instruction. It takes considerable time and effort to run a radio club efficiently, especially with a large helping of young fry, and help with lectures, administration and the like are welcomed. If you have some free time, please make some of it available to your local club, you'll be very welcome.

SILENT KEY

It is with deep regret that we record the passing of:

VK2AKB—John Bonnington.

Des VK2ZDN and Neil VK2ZCU are favourite calls at the Westlakes club where they have given some of the boys a chance for real success on v.h.f. This is just the thing to keep the ball rolling and make the best use of the materials available. Varley VK2SF had a clean out of the shack recently and, of course, the clubs benefited again. You can't imagine how useful books, magazines and components can be. I'm not sure if Jim VK2AHT has yet departed on his global flit, but departure is imminent if not actual—half his luck!

And while on the subject of flits—a not quite global one to Urunga by Tony VK2ZCT and Bill VK2XT resulted in prizes in two contests, despite difficulties. Bill made the grade in the legendary scramble and scored 46 contacts, while Tony came in with a place in the transmitter hunt.

Not everyone has success first time though. Jan the man (VK2BJO) is having all sorts of strife with his gear and has not radiated a signal for weeks, while John VK2ZJG is suffering from crystal sets in the front end which explains the lack of gain. Gordon is making boasts about the efficiency of the new VK2ZSG beam and claims it gives a 4 dollar gain—but to whom he didn't say. Our overseas members, Ron VK2ASJ and Alyn VK2ZAX, are just as active as ever, Ron on the air and Alyn in the Holden—there's rumour that he's going to fit a carphone—rust and all.

I hope nobody had any difficulty in contacting the two zulus early in April. If you did, see me at the next meeting, that's May 5, and I'll explain the finer points. The venue is the usual, Room 6 of the Clegg Building at Newcastle Tech. I'm told that there'll be a film as well as the lecture, so see you, 73, VK2AKX.

BLUE MOUNTAINS BRANCH

The annual general meeting of the Blue Mountains Branch was held at Lawson on Friday 17th March. Twelve members were present. Officers for the ensuing year were elected as follows: Chairman 2NR, Vice-Chairman 2NK, Secretary 2HZ, Treasurer 2ZFZ, Publicity Officer 2TM, Catering Officer 2ZFZ, and Construction Committee: 2ASZ, 2ART, 2TM and Dan Clift.

Bob 2ASZ brought along the 2 mx tx he is constructing for the club station. It is progressing very well, so should not be long before 2AUX is disturbing the ether on 2 mx. The club's 6 mx net is partly airborne and should not be long before it is in full swing.

Don 2ART has moved QTH to the Liverpool area, but his XYL still allows him out to the club meetings. Incidentally, Don has acquired a 15-foot boat with 40 h.p. outboard and intends to go maritime mobile—so wait for the big splash.

Ron 2ADA was absent due to a working holiday in VK5, so yours truly missed out on his usual discussion (?) with Ronald, but will make up for it when said Ronald returns. He is a little stubborn at times, but after a few months of persevering can usually be made to see the light, especially on a certain type of antenna.

Worked Sid 2AVK on 40 mx d.s.b. the other day and he did not swear once or even try to tell a joke. Keith 2ABK had an organ recital the other night so I suppose the township of Lawson had free entertainment that night. 73, 2TM.

CENTRAL COAST BRANCH

The annual meeting of the Central Coast Branch was held on Friday, 17th March. Lindsay 2ON gave his report for the year as President, outlining lectures and activities. The highlight of the report was the annual field day held in February. Despite bad weather and the resultant change of venue, the day turned out to be a great success. The Treasurer, Ern 2EH, gave a most satisfactory financial report for the year.

The office-bearers for the year are: President, Lindsay 2ON; Vice-Presidents, Alec 2AAK and Barry 2BUB; Secretary, Bill 2TS; Minute Secretary, Frank 2AFJ; Treasurer, Les 2AKL; Public Relations Officer, Gordon Procter. As no one felt they could do justice to the job of Publicity Officer, Bill 2TS is to fill in, while Mona 2AXS has a temporary but well earned rest. 73, Bill 2TS.

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VICTORIA

VICTORIAN DIVISION STATE CONVENTION

As Visited by "Naomi"

The Victorian Division State Convention was held at Paynesville on Saturday and Sunday, 11th and 12th March. Favoured by typically beautiful Victorian weather, those who attended thoroughly enjoyed every aspect of the function. Between sixty and seventy folk attended the gathering, among them being little Jennifer Owen, complete with pink hair ribbon, and aged just three weeks, while another noticed was Mrs. Horwood (mother-in-law of Bill 3CB) and just ninety-one years young, and marvellously active and interested in everything.

Saturday evening was taken up by the State Dinner, a most enjoyable repast served (with all the trimmings) at the Paynesville Hotel-Motel. After the dinner, the business part of the Convention was completed in probably record time, enabling all to enjoy the rest of the evening in a friendly "Get Together".

For Sunday, an all-day Lakes Trip on the "Tambo Princess" had been arranged, but in spite of the trip having been arranged some weeks in advance, and the arrangement having been confirmed as recently as Saturday, 4th March, our organisers were shocked when they were told (on Saturday evening) that the trip was declared "off" by the owners of the "Tambo Princess". This meant some considerable "racing round," particularly by Ken 3AFJ and Michael 3ZEO, and after some difficulty a substitute trip was arranged.

In the morning, we boarded the "Bluebird" at Paynesville and went first of all to Ocean Grange, where we went ashore for a picnic luncheon. While this was being prepared, some of us made our way over the sand dunes to the ocean beach, where some of the younger, and hardier, of the party did a bit of surfing, which appeared to be just what they wanted. On our arrival back at the picnic spot, we found that preparations for our luncheon were well advanced. Considerable credit is due to some of the ladies of our party for the help they gave to the caterers in getting ready the cold chicken, ham, etc., that formed the lunch, and which all hastened to enjoy "to the full"!

During the afternoon we were taken for a cruise on the Lakes, and all agreed that this trip was very well worth while. Perhaps the highlight of the afternoon's doings, as far as the youngsters were concerned was when each in turn was allowed to steer the boat all by themselves.

Sincere thanks are due to all the organisers and helpers who made the Convention such a memorable and enjoyable one. I am sure that all who took part were well pleased that they had been to this year's Convention. "Naomi" was, anyway!

EASTERN ZONE

We should have some new Hams on in the future when some of our s.w.l's pass their tickets. Gavin Kuch and Ray Malcome are doing the W.I.A. correspondence course at Maffra. Albert Cash is going to sit again later this year, also Trevor Gregory and Bob Stewart hope to have a go soon. Bob has just moved to a new QTH in Moe, but not much room in the new house for s.w.l. receiving equipment, so Bob will spend some time out on field days with George 3ZCG.

14, 21 and 28 Mc. have been giving the boys quite a thrill this season with Reg 3AWV, David 3DY and John 3JW (of Bairnsdale) working many world wide 10 mx stations using s.s.b.

Our 2 mx f.m. channel A network is becoming quite busy during the day and evenings, and the latest two to join the net are John 3AOJ of Sale and George 3AOD of Warragul. This channel is slowly becoming the Zone's v.h.f. net frequency on Friday and Sunday evenings with 3DY Maffra, 3ZDP Sale, 3ZCG Morwell, 3ZPL and 3AWV Yallourn most active.

Reg 3AWV is making a trip to VK4 and VK9 during April to attend a conference and reunion with his children up there.

The most active members on our 80 mx Zone hook-up are 3DY, 3AWV, 3AED, 3JW, 3CJ, and 3APT. We would like more to join in on Friday evenings, so put aside that evening to have a chat with your local Hams. 73, George 3ZCG.

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QUEENSLAND

TOWNSVILLE AND DISTRICT

At the last meeting of the local Radio Club, quite a lot of discussion centred around a letter to the City Council with regard to a vacant piece of land on which to erect a club house to be the means of housing station VK4TC and where the members can meet in comfort. Presently, the local studio of the "B" class radio station will be undergoing renovations and the room now used will be required for other uses. This means that the present members will have a hard row to hoe to look for the necessary finance to erect a

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building, presuming that they are lucky to obtain the necessary building site. I can only wish them every success in their efforts. With youth on their side, the present club members can eventually make their dream come true.

It also appears that one of the local high schools is interested in the Youth Radio Club, the principal being a very keen listener to the Amateur bands, and would like to see some of the students interested. So maybe the local club will be able to help this along.

I can certainly run into strife in trying to glean news of local interest. One of my news spies informs me he heard a local on the air referring to the writer as a nit-wit and a imbecile. Ah well, as Pansy would say, "sticks and stones, etc," so I'll just think how the Amateur Code of being a "Gentleman" seems to be slipping. Forgive and maybe forget the incident.

No news to hand how the two Amateurs in Ingham fared during the recent record flooding of the district and if they require any assistance in getting gear together again.

Glad to read that there has been an increase in the VK4 membership again, even though they have raised the fees. Pity some of the **old timers** are no longer members and not interested in the I.T.U. See that the Division has to look to ways and means to increase the income. Also finds it hard to fill the executive positions.

Wonder how the recent break-through of the JA stations on v.h.f. affected the t.v. in the fringe areas of channel zero? They certainly romp through when conditions are favourable. 73, Bob 4RW.

BUNDABERG AMATEUR RADIO CLUB

I feel that this time I should give all readers a run down on the club here in Bundaberg. We have a membership of about 30, of whom 20 have call signs. Our constitution requires all to be members of the Wireless Institute of Australia. We have our own club rooms at Avoca St., West Bundaberg, which is divided into class and meeting room, workshop and transmitting room, which houses the h.f. and v.h.f. gear. The club operates under the call sign of VK4BW. A.O.C.P. classes are held each Thursday night and a Y.R.S. class for about 20 lads is conducted each Saturday morning. General meetings are held the first Wednesday of each month at 1930 hours and all visitors are welcome.

During March, club activity in various fields has been high. Bob 4UD, Bob 4ZZE and John 4ZJP are busily engaged in building the club entry in the Centenary Year Raft Race up the Burnett River. As it is the first time a radio controlled raft has ever been seen in this fair city, it should prove a most novel event and invoke much interest among the locals. Work is progressing satisfactorily on the emergency 1.2 kw. alternator. Our sincere thanks to Alby and Jim for their sterling effort here. Also to Reg, Pete and Ian Fry for the trailer. To Bob 4UD for the transformer and to any others who helped with the project. There is still a fair amount of work to do to rig it up, so it may be some time yet before it is completed.

Several of our v.h.f. members travelled to Tewantin at Easter week-end for a v.h.f. field week-end cum convention. The boys really enjoyed themselves and came home with glowing reports of a marvellous week-end. Don 4NK put his first signal out on 6 mx on Sunday, 26th March. With a few more adjustments, etc., Don will be a regular member of the 6 mx net which is running hot these nights organising the VK4 Convention. The chaps cn this net would like to hear more callers. What about it, you chaps with 6 mx gear lying idle!

A tape lecture night was arranged for Wednesday, 29th March. The tape on cubical quads, complete with slides, is from VK2 Division, and as there are three quads in various stages of construction in town, it proved to be an enjoyable and instructive night.

Visitors to Bundaberg at Easter included Les 4XJ, George 4ZMG and Ian Binnie, one of our ex-Y.R.S. boys who is now with D.C.A. Roy 4ZWR is home from his recent trip through VK3. Roy made many 6 mx contacts. He also met members of the Moorabbin Radio Club and inspected the transistorised rx recently featured in "A.R." His trip was the subject of a talk given at the April meeting. 73, Rusty 4JM.

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SOUTH AUSTRALIA

For some unknown reason PanSy to you, 5PS, the Logie Ham Author, has to have a holiday at this time each year, and hands over this task to "the Gawler gang". And what is 5PS doing whilst away? None of us have been able to find out exactly, but he is likely to bob up on some frequency or other on a.m. and try to work some of his many friends on s.s.b. The strain must have been too much for him this year for in spite of constant monitoring 40 there has been no sign of him. Could it be that he has gone s.s.b.? For we did not look for him on that mode.

Some recent happenings noted at this QTH (5EF) include an interesting cover of mobile operating by Les 5AX from the 6th to 27th March. Les' journey extended from Gawler to Port Lincoln and return, thence to Ballarat and return, during which time skeds were kept on 7074 kc. and at no time was the signal from him other than "loud and clear". Demonstrating a better distance and direction cover for 40 than provided by frequencies used by 5WI for weekly broadcasts at present. The only blot on Les' travels was the mutilation of his whip antenna by some vandals whilst at Port Lincoln. This caused some problems to rectify; he being aided in the task by Lance 5XL, also holidaying there. A lesson is to be learned from this experience, that is, never to leave a whip mounted on the car, particularly when parked unattended. All mobileers please note.

Lance 5XL and his trusty KWM2, whether at Clare or the portable location at Encounter Bay, puts out a potent signal on all bands, enabling him to keep in touch either locally or on the DX.

A contact with the "noisy gang," Frank 5FJ, Athol 5LQ, Lionel 5LB and Jack 5LN, recently uncovered some diverse actions of those gentlemen. Frank informed us that he was to lay carpets in his shack, of the solder-absorbing quality presumably, and that he was engaged in pole climbing for feed line matching and antenna matching, he being determined to have that elusive 1 to 1 s.w.r. Jack has been searching for a suitable 100 foot tower at bargain prices (no trade in) and on one occasion took Athol with him. The inspection site turned out to be on the side of a very steep hill, Jack made it, but Athol was restricted to half way up and a distant view only. Come on Athol, more PT and less coffin nails, for when Jack makes the deal he will need assistance to remove it, and we cannot have you going "that-a-way" whilst the rest go "this-a-way". By the way, the floor of Athol's shack is polished dance floor boards, that is how he gives us that reverb effect on his modulation.

It is very seldom these days to get on any DX band and not find Lester 5LC dragging them in in great style. He seems to have a consistently good signal that attracts the distant parts. I agree with you, Lester, that big nets should not be worked other than with vox.

Remember Dud 2DQ? Heard him on the other night after a spell of quite some time. He was talking to Bill 5XB. Come on chaps, dust the gear off and join in more often. For those interested, Dud has a sparkling new 144 meg. converter and awaits a 2 mx signal in his direction. Over to you, Mick.

Al 5MF has his new beam operating on 10 metres and now picks off the DX as he pleases.

Bob 5RI recently heard on 80 metres. Bob was a regular to these parts many years ago and indicates to be active again on both the d.c. bands and on v.h.f. He should have more scope with the latter these days for with the activity at Clare, Port Pirie, etc., to aid the programme, it will be a change from the old days when Bob trod the path on his own from those parts to the city area.

A good test for the linearity of Brian 5BI's gear was to hear a recent contact from him to Vern 5VB, when Brian allowed Dave 5DS to use the mike!! Yes Brian his real Scot voice came through first class, no excuse now Dave, s.s.b. will carry you.

Have not heard Ron 5KS about much lately. Does Council work keep you too busy Ron, or are you building another super-super?

Excuse me for the following, but this is the only month of the year it is likely to be quoted, you know, "The Thing and all that," but at date the number of Sidebanders in VK as listed at this QTH is 931, of which 113 are in VK5, and still they grow. This covers both the 80-10 bands and 6 and 2. For further information on this matter, see May 1968 notes. Hi!

Each year there is a fair sprinkling of VK5s in the Sig. Section of R.A.A.F. in the Anzac March, and Ray 5RK is usually amongst them. This year, however, his post of President of A.F.A. will take him to the head of things where he will lead the R.A.A.F. By the time you read this all will have happened, but it is mentioned in case you wondered why Ray was not with the boys, but up front.

A certain VK5, whom we will leave nameless, but who mobiles quite a bit, found himself with a flat set of batteries after a long session at the mike whilst stationary. This, in spite of the fact that he has an auxiliary battery wired into the car circuit. The sight of such a calamity, with XYL querying the wisdom of it all is quite distressing. The solution? Wire in a couple of diodes as per "QST," Dec. 1962. It takes a long time for some people to learn.

Our old friend, Joe 5JO, has had a spell in hospital. Reports at time of writing indicate that he is doing all right and should soon be about again.

Son of a gun, Geoff 5TY has returned from the Easter Convention held this year in Hobart and is looking fitter than ever. Geoff has been doing battle at the Convention for some years now and never lets the opposition put it over sunny South Australia. One of those jobs we members take for granted, but which involve lots of time and effort, particularly in getting answers to the many letters sent or are things a bit different these days?

Had a few words with Max 5GF holidaying at Encounter Bay where he combines hamming with a spot of fishing. Did you find time to make the modulator behave, Max, or were they biting too well?

Lance 5XL, at the same spot over Easter, took the boat out for a run and came ashore with two small fish, while the professionals were hauling them in with great gusto. Anyone tell you Lance you're suppose to hang a worm on that hook thing?

Ran into Brian 5CO, of Port Pirie, in the course of my rambles and was introduced to his two recent additions to the family. No, nothing like that. A member of Rotary, Brian and his wife are looking after two Asian nurses who are doing their training at Port Pirie Hospital. Half your luck, Brian; Lee and Kay are two very charming young ladies.

Several car loads of v.h.f. enthusiasts recently journeyed north to the Hummocks and south to Cape Jervis complete with gear for 52, 144 and 576 Mc. Can't think who they all were, but Bob 5ZDX was at one end and Garry 5ZK the other. Signals on 6 mx were 5 and 5 from whip to whip, which is not bad for 120 miles or thereabouts. On 2 mx, of course, communication was 9 plus, but on 576 Mc. no new records were established. Carriers were heard but no QSO completed. Keep trying and who knows next trip it will be easy.

Youth Radio has its ups and downs. The latest in the field seems to be on the up and up. The Elizabeth Radio Club has eighteen junior members which is all the facilities can handle at present. However if present enquiries are any indication it will not be long before another class is started. In addition to 26 enquiries from juniors, thirteen adults have sought instruction in the gentle art of Ham Radio. The Elizabeth group tackled this extension of the Youth Radio Scheme by implementing an Adult Home Study group which is functioning very well indeed. Club members directly concerned with the running of the classes are Trevor 5ZMT, Allen 5FD and Bob 5ZIA with help from Phil Chamberlain, Steve Johnston and John Eastaff. The ether is certainly going to be congested down Elizabeth way when these all qualify. Good show, fellows.

If you have missed 5EF from some of the frequencies it is only because he is busy doing a 1,000 hour overhaul. A model shack at any time, it will surely be the B.B.S.I.T.S. when finished (sorry, PanSy, I know that's your line, but seeing is believing).

Congratulations to Colin 5ZHJ on his recent engagement. Heather, it must be clearly understood, "DX before dishes".

Hardly VK5 news, but of general interest I feel sure. While in VK3, paid a visit to the site of 3MH to have a look at the Sterba curtains on Tomboy Hill (Ballarat), only to find the Sterba relegated to the past. An S.E.C. pylon in course of construction will carry a 3 element on 40 at the 108 ft. level, a TH6 on 20 above that, and surmounted by Yagis for 144 and 432 Mc. Eric 3ZL, who was my guide and is assisting John with the erection, told me there was 7½ tons of steel in the tower alone with goodness knows how many yards of cement to hold the whole thing down. Sorry I missed you, John, but I'll sure be listening for you. 73, from Gawler, 5EF and 5AX.

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WESTERN AUSTRALIA

Well here it is, time to waffle on for a few more lines again. What shall we start with? Anyone would think we were embarrassed with a surplus of news items instead of the reverse being the case.

By the time this reaches your tired old optics, the Annual Meeting will be over and a new Council will be at the reins. Perhaps by then sufficient time will have elapsed and a suitable applicant will have been sifted from the forty or fifty volunteers to write "A.R."

notes. To each of the new councillors, we wish good luck and hope that their suggestions will be a guide and a benefit to this Division.

A busy call sign on the bands these days is 6WG, Wally. Apart from regular skeds on 80 and 40 mx, Wally has been active on 6 mx, getting among the JA and KR6 stations.

Inhabitants of the southern portion of the State may be excused for their mutterings about the Loch Ness Monster appearing on local waterways. It would appear that Pat 6PH has been sporting himself behind the controls of a fast marine craft. That in itself is enough to make some of the locals raise an eyebrow or two, but imagine the comment when Aub 6XY got into the act by being towed along behind with a couple of floor boards tied to his feet! Aub tells me that water skiing is great fun, but he would not consider my suggestion that he go mobile marine. Apart from motor boating, Pat is currently building an all-band sideband transceiver—he's a tiger for work.

Heard Tom 6MK operating on 80 mx the other night. Not very often do we hear this call on the lower bands for local rag chews, but it certainly makes for a nice change.

One of my spies reports having heard Mike 6QJ making a re-appearance on the bands after his recent bout with the medicos.

News to hand from Ron 6RS that he was recently visited by K4TML, Dan Summers, and his XYL who were on a six weeks' vacation. Dan would like to hear more VK6 calls at his home QTH in Florida.

Weather satellites are still claiming the attention of "Australis" co-ordinator, Don 6HK, who has recently completed a new helix antenna system.

If any member of the VK6 Division requires confirmation of a QSO with the late G. F. Lucas, VK5LL, please forward particulars of the QSO, together with a stamped addressed envelope, to: VK6DC, 80 McDonald St., Como, and Henry will be only too pleased to complete a card for you.

Peter 6ZEP has graduated from commercial radio and virtually "got with the strength" in the world of t.v. Good work, Peter.

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Our Federal Councillor Roy has returned from the Federal Convention full of praise for the organisers of the Thirty-First Convention. After hearing a run-down on the menu for the Convention Dinner, I'm inclined to agree. I wonder who was responsible for the following gem which rounded off a very cleverly worded menu and toast list?

> "You are requested to have a HULL of a good time, so call a CHAMBERLAIN, PIERCE the cork and even if we do get PORTLEY we can take a CRUISE without OWEN anything and RANKIN will have a TAYLOR to PINCOTT your BATTRICK if you HEPBURN it." Wow!

Roy also brought to notice the fact that one VK7 Amateur actually lost his life in the disastrous Hobart fires and others lost all their possessions. A tarpaulin muster at a recent meeting will go to help these folk. If you would like to help, it is not too late to send your donation to the Secretary.

Bill 6WY, his XYL and second harmonic, left Perth about a week before Easter to travel overland to Sydney. The occasion was the venture into matrimony of Bill's first harmonic. Bill suffered a back injury shortly before departure and was in some doubt about the possibility of making the journey. However, I think he was spurred on by the vision of some new sideband gear reclining on the shelves in VK2. I wonder just what will have to be jettisoned in order to bring home the bacon.

There was a possibility that Bernie 6KJ might have to adjourn to the big city for some medical treatment, but at the moment, smoke signals from the southern area are a bit windswept and I am not too sure of the position. Hope nothing too serious is in the offing for you OM.

Despite spirited efforts from many directions to dispose of him, old man stork continues to hover above someone's chimney top. One such lucky QTH recently visited was that of Neil 6ZDK and his XYL. Congratulations to you both on the arrival of a baby daughter.

Lucky Tom Provan, 6DP, off on a trip to England and the United States. Business of course, but what a great opportunity to see how the other half lives.

Well, that just about wraps it up for now. 73, Ross 6DA.

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TASMANIA

During Easter, the Federal Convention of the Institute was held in Hobart. This is the first time it has been held in VK7 since about 1935, and I'm sure everyone in the Division hopes it is not another thirty-two years before the Convention is held here again. On the Saturday night the dinner was held and on Sunday an all-day trip was arranged to Port Arthur, an old convict prison, near Hobart. In addition to many mainland visitors, a number of Intrastate observers were present. We may well say that the Convention was, at least socially, a success.

The slow Morse practice on the 6 mx net frequency has begun again for this year. If the present rate of Z calls dropping the Z continues, the State will soon have none left.

My spies from the north tell me that Harry 7BR will soon be moving from his present QTH of Evandale and will live in Launceston. Apparently the new QTH has not yet been decided, but it will be a good spot for DX, I'll bet.

That appears to be about all I can think of for this month. Either news is getting scarce or I'm getting forgetful in my old age. 73, 7ZLP.

HAMADS

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FOR SALE: Pye Reporter Mk. III. Converted to 53.032 Mc. net. Complete with crystals, carrying cradle, power supply and mobile antenna. Unit wired for 6 volt operation. Simple conversion to 12 volt. Excellent condition. $50. 30 Clarks Rd., East Keilor, Vic.

FOR SALE: Two Pye Reporter Radio Telephone Sets in fair condition; also one Transmitter-Receiver, Type TR1196A, brand new with plugs and wiring diagram. First offer takes. O'Brien, Edgar Road, San Remo, Vic.

SELL: Bendix Frequency Meter, complete, a.c. power supply, book, etc., $75. VK3SM, Phone 36-4406 (Melb.).

SELL: Halicrafter HT37, c.w., d.s.b., u.s.b., l.s.b., 80-10 mx, good order and condition VK4CK, 72 Canning St., Warwick, Qld.

SELL: Heathkit GC1A transistorised 5-band communications receiver, incl. handbook, exc. cond., $160 o.n.o. Gonset "Super 12" mobile tunable converter, cal. 80 to 10, neg. earth, exc. cond., $35 o.n.o. 122 Transceivers (2), with handbooks, good working order, $40 each VK4LU, Peter Long, 63 Eyre St., North Ward, Townsville, Qld.

SELL: 122 Set, P.M.G. Rack, Geloso VFO, Valves, Transformers, V.h.f. Parts, at prices to suit beginners. Back copies "QST" also available. VK3ASW, 5 Pippin Ave., Syndal, Vic. Phone 232-5440.

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A LARGE RANGE OF TRANSMITTERS, RECEIVERS, TEST GEAR, AND DISPOSALS RADIO PARTS AVAILABLE

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Freq. range 500 Kc. to 30 Mc. Usable to 50 Mc. 500 Kc. xtal and 250/500 Kc. b.f.o. Provides heterodyne output in steps of 1 Mc. Gear driven dial. Calibration every 2 Kc. "Spiked" output at 1 sec. intervals to identify beat note. Power req.: 12v. d.c. at 300 mA., 250v. d.c. at 15 mA. At this price who can afford to be without one. $8.00.

★ **VARIACS**
115v. 18a. New in cartons, $18.00 ea. or $32.00 pair.

★ **TRANSCEIVERS, TR1986-7**
115-145 Mc. Employs heterodyne exciter in transmitter. TT15 p.a. Single xtal locks Tx and Rx on same frequency. In-built modulator. Supplied with 4.86 Mc. xtal. $30, circuit $1.

★ **SR550 DUAL CONVERSION COM. RECEIVER**
160 metres to 6 metres, Amateur Bands only. 3.5 Mc. xtal band edge marker, xtal supplied, product detector for s.s.b. $240, 10% discount for cash.

★ **SCR522 V.H.F. TRANSMITTER/RECEIVER**
100-150 Mc. Complete with tubes, $28.

WANTED TO BUY
Communication Receivers, Test Equipment, etc. Call, write or phone Equipment inspected and picked up at your convenience any night or week-end.

★ **PERSPEX SHEET**
1/16 inch thick. Size 4¾" x 16". $1 per sheet.

★ **COMMAND TRANSMITTERS**
4-5.3 Mc., 5.3-7 Mc. Complete with tubes, $15.

★ **TR3624 TRANSMITTER/RECEIVER**
Approximate frequency, 200 Mc. Contains 46 miniature tubes, $30.

★ **VALVES**
EF50, 20c ea.; 7C7, 10c ea.; CV131, 6CQ6, 50c ea.; 6AC7, 20c ea.; 6AL5, 20c ea.; 6C4, 6AM5, 50c ea.; 6J6, 50c ea.; 6FQ5, 50c ea.; 12AD6, 60c ea.; 12AU6, 60c ea.; 12BA6, 50c ea. Mullard MW6-2 t.v. projection tube, 3", $1.50.

★ **SIGNAL GENERATORS**
TE22 Audio Generator, freq. range: sine 20 c.p.s. to 200 Kc., square 20 c.p.s. to 25 Kc., in four ranges. Output, 7v p-peak. Output impedance, 1,000 ohms. Price $42.

★ **METERS, P25 TYPE**
0-500 uA., $5.25; 0-100 uA., $6.95; 0-1 mA., $4.50; 0-10 mA., $4.50; 0-50 mA., $4.50. Full range of Meters and Multi-Testers available.

★ **MINIATURE CAPACITORS**
New shipment. 600 v.w. Values: 0.001, 0.02, 0.005, 0.0005, 0.0002, 0.0001 uF. $2 for 80, plus freight.

★ **EDDYSTONE MODULATION METERS**
160 Metres to 10 Metres. Provision for phones. Complete with antenna and carrying case, $12.00.

★ **COMPUTER BOARDS**
Contains five OA202 silicon diodes. Pot core, capacitors, etc. 75c each.

★ **SWITCH POTS**
Miniature transistor radio type pots. 2 megohms and 5 megohms. 12c each or 10 for $1.00.

★ **DYNAMIC MICROPHONES**
DX29 high impedance, with in-built gain control and desk stand. Response 100-15,000 c.p.s. $7.50.

★ **MILLER 455 Kc. PRE-WIRED I.F. STRIPS**
Comprises two i.f. stages, ceramic filter, diode detector, 55 db. gain, NPN silicon transistors, d.c. requirements 6v. d.c. 2 mA., size 1½ x ½ x ½ inch. $8.70 inc. tax.

★ **TR10A MULTIMETERS**
100,000 ohms per volt. Ranges, d.c. volts: 0.5, 2.5, 10, 50, 250, 500, 1K; a.c. volts: 2.5, 10, 50, 250, 1K; d.c. current: 10 uA., 1 mA., 25 mA., 250 mA. 10 amp.; resistance: 20K, 200K ohms, 2 megohms, 20 megohms. To clear, $25.95.

★ **POTENTIOMETERS**
Wire wound, 40c each; carbon, 25c each.

★ **RESISTORS**
¼ watt, I.R.C., Welwyn, Eire, Ducon, Philips, $2 per 100.

★ **¾ H.P. 2-STROKE MOTORS**
Ohlsson and Rice. Brand new, just imported from America. Weighs only 5¾ lbs. 6,300 r.p.m., supplied with 3 : 1 reduction gearbox, output 2,100 r.p.m. Ideal for driving Alternators for Field Days. Fuel consumption 1 pint per hour. $30.

ANY QUERIES
Beginners are welcome, ask Jim and Laurie Gardiner any questions. They are Amateur Radio operators and will be only too pleased to assist.

★ **CRYSTALS**
Personal shoppers only, $1 each.

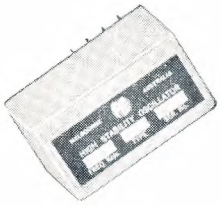
★ **SPECIALS**
New 815 valve, $1. New DA41 (TZ40), $1.50.
3000 type Relays, 50c each.
Inter-Office Phones, 15-station type, $4 each.
7-pin skirted Valve Sockets, P.T.F.E. insulation, silver plated, only 20c each, c/w. shield.
Speaker Transformers: 7000 ohms to 2 ohms; 10,000 ohms to 3.5 ohms; 50c each.
9-pin skirted P.T.F.E. Valve Sockets with shield, 50c ea.
3 uF. 1000v. d.c. Block Capacitors. Only 25c each or $2 per dozen

ALL ITEMS FREIGHT EXTRA

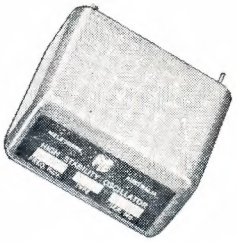
UNITED TRADE SALES PTY. LTD.

280 LONSDALE ST., MELBOURNE, VIC. (Opp. Myers) Phone 32-3815

HIGH STABILITY OSCILLATORS



XL601

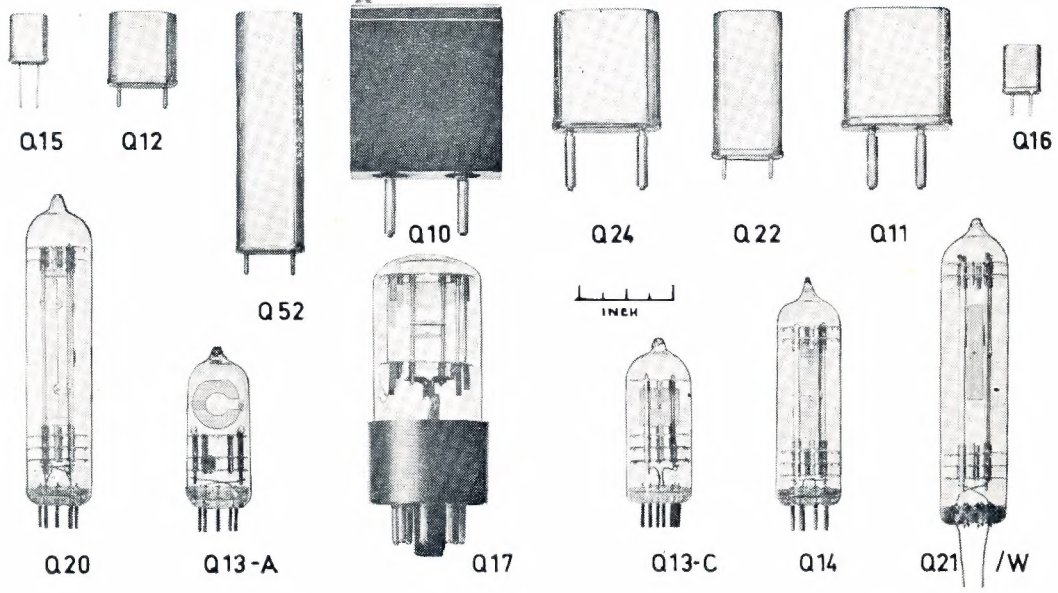


XL560 TCXO

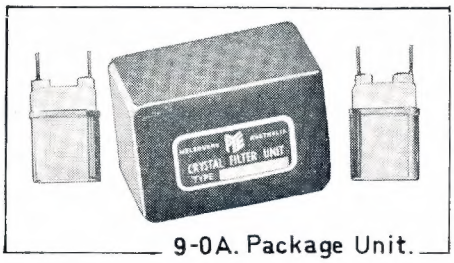
CRYSTAL PRODUCTS

AUSTRALIAN MADE

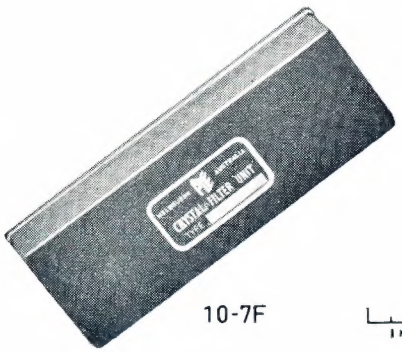
QUARTZ CRYSTALS



CRYSTAL FILTERS



10-7A
10-7B
10-7C

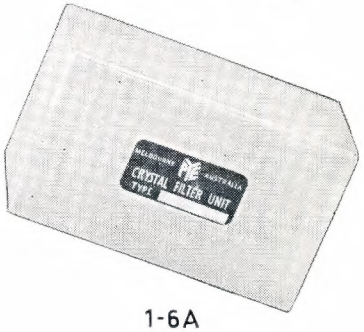


10-7F

INCH

CF100/8

Special 6MHz Units



1-6A

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PYE PTY. LTD.

CRYSTAL DIVISION

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